MARCH 30, 1957 Per (Sec 8) PAGES 647 TO 698

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2
Telegrams: LANCET, RAND, LONDON Telephone: TEMPLE BAR 7228 and 7229

No. XIII OF VOL. I, 1957 — LONDON, SATURDAY, MARCH 30, 1957 — Pp. 104—Price 1s. 6d.
No. 6970 VOL. CCLXXII — Founded 1823 PUBLISHED WEEKLY Registered as a Newspaper — Annual Subscription £3 3s.

6 APR 16 1957
Cont. Copy

Adelphane

[0.1 mg. Serpasil *(reserpine)* + 10 mg. Nepresol *(1, 4-dihydrazinophthalazine)*]

for Mild and Moderate HYPERTENSION

A well tolerated treatment for those cases showing inadequate response to Serpasil alone.

CIBA

'Nepresol', 'Serpasil' and 'Adelphane' are registered trade marks. Reg. user. CIBA LABORATORIES LTD., HORSHAM, SUSSEX

2/7

CAREERS IN MEDICINE
Edited by P. O. WILLIAMS, M.A. Cantab.), M.B., B.Chir., M.R.C.P.
With contributions from 49 eminent medical authorities
Cr. 8vo 292 pages Price 15s. net, plus 1s. 4d. postage

This book outlines the particular qualities of mind, the type and amount of specialised training, required in each branch of the Medical Profession.

". . . it should be in the hands of everyone who has to advise medical students, and certainly should be consulted by every newly-qualified doctor."—*The Practitioner.*

Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

IN THE MENTAL HOSPITAL
Eleven articles reprinted from THE LANCET.

A group of articles chiefly concerned with the value of active occupation and work for mental patients and the means whereby it is best provided.

72 pages. Price 2s. 6d. (postage 4d.)

The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

THE ESSENTIALS OF FORENSIC MEDICINE
By CYRIL JOHN POLSON, M.D., F.R.C.P.
Barrister-at-Law; Professor of Forensic Medicine University of Leeds.

"It is superbly done, for he writes well, lucidly, and sanely, weaving the vivid and the more mundane chapters of forensic medicine, medical ethics, law and insanity into a comprehensive whole that is both informative and readable."—*The Lancet.*

562 pages 30s. net, plus 1s. 6d. postage

The English Universities Press Ltd., 102, Newgate-street, London, E.C.1

MIGRAINE AND PERIODIC HEADACHE
By NEVIL LEYTON, M.A., M.R.C.S., L.R.C.P.

Second Edition 136 pages 12s. 6d. net

Wm. Heinemann Medical Books Ltd., 99, Gt. Russell St., W.C.1

Sixth Edition *Now available*
PRINCIPLES OF MEDICAL STATISTICS
By A. BRADFORD HILL, C.B.E., D.Sc., Ph.D., F.R.S.
Demy 8vo 314 + x 10s. 6d. net, plus 10d. postage
Revised and enlarged (containing a new chapter on Clinical Trials and 16 pages of random sampling numbers).

The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2.

UNITED STATES OF AMERICA AND CANADIAN SELLING RIGHTS HELD BY OXFORD UNIVERSITY PRESS, INC.
114, Fifth Avenue, New York, 11, N.Y., U.S.A.

Third Edition
INTRODUCTION TO DISEASES OF THE CHEST
By JAMES MAXWELL, M.D.(Lond.), F.R.C.P.(Lond.)
Physician, Royal Chest Hospital; Physician to the Ministry's Mass X-ray Unit; Consulting Physician, Royal National Sanatorium, Bournemouth; late Physician, St. Bartholomew's Hospital.
Demy 8vo 308 + xii 66 Half-tone Illustrations
12s. 6d. net, plus 1s. 4d. postage.

Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

HOW TO WORK—
ADVICE TO STUDENTS STARTING MEDICINE.
An address to the London Hospital Medical Society.
By A. E. CLARK-KENNEDY, M.D. Camb., F.R.C.P.
Demy 8vo. 16 pages. Price 1s.

The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

Dorland's ILLUSTRATED MEDICAL DICTIONARY
(New 23rd Edition)

This brand new Edition of the *"big red dictionary"* is completely revised and up to date. It is, and always has been, THE *Dictionary* of the Medical Sciences.

- Now contains 104,000 definitions—20,000 more than any other Medical Dictionary.
- 4,000 New Words added.
- All anatomical tables revised.
- Completely reset throughout.
- Pronunciation more understandable than in any other Medical Dictionary.

1,598 pages, more than 700 illustrations. Flexible binding. Thumb Indexed. 87s. 6d.

W. B. SAUNDERS COMPANY LTD. **7, Grape Street, LONDON, W.C.2**

AFDIGYL

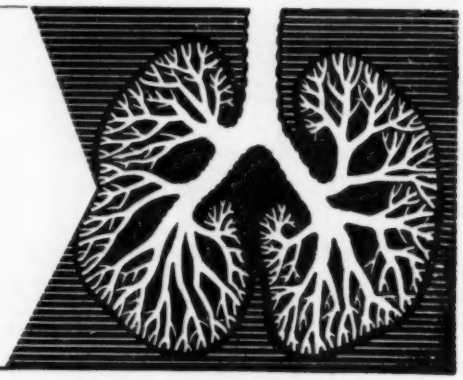
DIGITOXIN with AMINOPHYLLINE

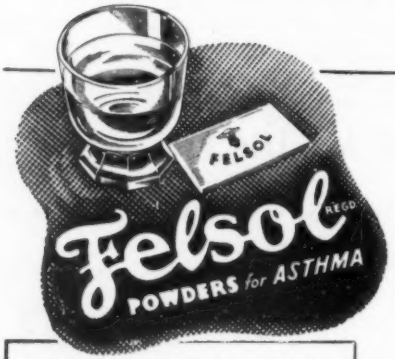
Digitoxin 0.05 mg.
Aminophylline 50.0 mg.

For rapid digitalisation with increased diuresis in
Congestive heart failure **Cardiac asthma**
Auricular flutter **Auricular fibrillation**

THE ANGLO-FRENCH DRUG CO. LTD. 11-12 GUILFORD STREET, LONDON, W.C.1

IMMEDIATE CONTROL OF ASTHMA





Before the underlying cause of asthma can be determined the physician invariably looks for an immediate measure for controlling the chief lesion BRONCHOSPASM. Complete reliance can be placed on FELSOL—prescribed for years by doctors for its immediate and sustained effect in relieving asthma attacks. Non-narcotic and non-cumulative, FELSOL is easy to take and gives full relief in perfect safety.

★ NO CONTRA-INDICATIONS
★ SAFE IN CARDIAC CASES

Clinical sample and literature on request

BRITISH FELSOL COMPANY LTD., 206/212, ST. JOHN STREET, LONDON, E.C.1

MARCH 30, 1957 PAGES 647 TO 698

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6970 LONDON: SATURDAY, MARCH 30, 1957 CCLXXII

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

A Concentrate of Human Anti-hæmophilic Factor — R. A. KEKWICK, D.SC., P. WOLF, M.B. 647

Staphylococcal Bronchopneumonia in Debilitated Hospital Patients — G. A. GRESHAM, M.B., M. H. GLEESON-WHITE, M.B. 651

Sodium Balance Studied with ^{22}Na and an External Counter for Measuring Whole-body Radioactivity — M. M. MARTIN, M.R.C.P., GEOFFREY WALKER, M.R.C.P., MALCOLM CHAPMAN, M.B. 653

Comparison of Gastric Emptying and Secretion in Men and Women — MOLLIE BOOTH, M.B., J. N. HUNT, M.D., JILLIAN MILES, B.SC., F. A. MURRAY, F.R.C.S. 657

The Gastro-œsophageal Junction — G. S. M. BOTHA, F.R.C.S., R. ASTLEY, M.D., I. J. CARRÉ, M.R.C.P. 659

Radiological Localisation of the Diaphragmatic Hiatus — G. S. M. BOTHA, F.R.C.S. 662

Heparin Clearing In Vivo — V. FELT, M.D., D. REICHL, D.CHEM. 664

Addisonian Crisis Due to Pellagra — F. D. ROSENTHAL, M.R.C.P., F. LEES, M.R.C.P. 665

Talc Granuloma of the Umbilicus — R. D. G. CREERY, M.R.C.P., D. M. MCCLURE, M.B., R. J. RUTHERFORD, F.R.C.S. .. 667

Renal Colic and Persistent Hypercalcuria Following Self-administration of Vitamin D — P. FREEDMAN, M.R.C.P. 668

PRELIMINARY COMMUNICATION

Cytopathic Effect on Primate and Rodent Tissue-cultures of Agent Isolated from Measles Patient — JOYCE WRIGHT, D.M. 669

LEADING ARTICLES

"WITHDRAWAL" 673

PHOSPHATASES AND PROSTATIC CARCINOMA 674

UNIVERSITY APARTHEID 675

RESEARCH BEYOND THE TWEED 676

ANNOTATIONS

Human Antihæmophilic Factor for Therapy 677

Beryllium Poisoning 677

The Floppy Infant 678

Gastro-enteritis in Uganda 678

Rovsing's Operation 679

Some Questions 679

SPECIAL ARTICLES

Organisation in General Practice — P. M. HIGGINS, M.R.C.P. 680

PUBLIC HEALTH

"Ophthalmia Neonatorum" and Minor Neonatal Infection — I. GORDON, M.R.C.P. 682

Immunisation against Diphtheria 682

Population of England and Wales 682

NEW INVENTIONS

A Drop-tilt Bed for the Labour Ward — G. C. BIRD, M.B. 670

LETTERS TO THE EDITOR

Fœtal and Neonatal Anoxia (Dr. D. G. Leys) 684

Bronchial Carcinoma (Mr. A. L. d'Abreu, F.R.C.S., Dr. A. Brian Taylor) 684

Hospital Medical Records (Dr. M. O. Skelton) 684

Insulin Treatment of Schizophrenia (Dr. H. Pullar-Strecker) 685

Heberden Society (Dr. A. T. Richardson and others) 685

Cigarette Smoking at School (Dr. P. W. Bothwell) 685

Rheumatoid Arthritis with Chronic Leg Ulceration (Dr. J. H. Allison, Dr. F. R. Bettley) 685

A New Clinical Entity? (Dr. D. A. Hicks) 686

Ætiology of Pre-eclampsia (Mr. G. W. Theobald, F.R.C.O.G.) 686

A Study of Wake (Dr. G. M. Jacobides; Dr. L. H. Lerman) 686

Unmarried Parenthood (Dr. William Hamilton; Mr. Cyril Greenland) 687

Alloxan as a Possible Therapeutic Agent for Primary Carcinoma of the Liver (Prof. Theodore Gillman, M.B., Dr. Michael Hathorn, Dr. N. McE. Lamont; Dr. W. Gross) 687

Chronic Bronchitis and Smoking (Dr. J. P. Anderson) 688

Birthdays of Spastics (Mr. J. D. Metrakos, PH.D., Mr. G. I. Paul, PH.D.) 688

Obstetric Flying-squads (Mr. Arnold Walker, F.R.C.S.; Mr. J. T. Gray, F.R.C.S.E.) 689

Effect of Quinidine on Potassium Flux (Dr. C. K. V. v. Dommelen) 689

Fractures of the Femoral Neck (Mr. Philip Newman, F.R.C.S.) 689

Government and Profession (Dr. Armorel Nettell; Dr. John Fry) 689

REVIEWS

Notices of Books 671

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents 683

PARLIAMENT

The Government and the Social Services 690

Foreign Patients and the N.H.S. 691

Reciprocal Agreements 692

Question Time 692

OBITUARY

Henry Ernest Sigerist 692

Thomas Grainger Stewart 693

Frederick William Price 694

Isaac Jones 694

John Frederick Nicholl 694

Kate Fraser 695

Malcolm Campbell 695

Gerald Stanley Hovenden 695

Desmond William George Faris .. 696

John Garvin Stebbing 696

Alexander Alan Guild 696

NOTES AND NEWS

Plan for Withdrawal from N.H.S. 697

OUTSTANDING OPINIONS OF AN OUTSTANDING BOOK

"TRULY A MASTERPIECE and the best book of its kind that I have seen in the last decade . . . exact detailed instruction of how much and how often instead of loose instructions that such and such a drug has been found of value"

RESEARCH NEWSLETTER of the College of General Practitioners

WHITLA'S DICTIONARY OF MEDICAL TREATMENT

Edited by R. S. ALLISON and T. H. CROZIER

870 pp. 52s. 6d., postage 2s. 3d.

"USEFUL, AUTHORITATIVE, quick reference guide to therapy . . . entirely re-written . . . every reason to be proud of this contribution to medical literature"

THE PRACTITIONER

"Covers [also] a wide field in tropical medicine"

JNL. IRISH MEDICAL ASSOC.

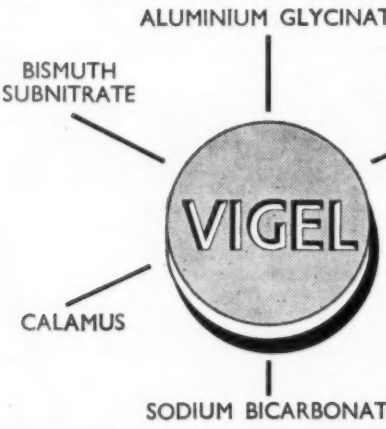
Baillière, Tindall and Cox, 7 & 8 Henrietta Street, London, W.C.2

VIGEL TABLETS

FOR

QUICK, SURE RELIEF AND CONTROL IN THE TREATMENT OF GASTRIC AND DUODENAL ULCERS

GASTRITIS · HYPERACIDITY AND NERVOUS STOMACH COMPLAINTS



HOSPITAL TESTED AND APPROVED

PRESCRIBABLE ON E.C.10

DOSAGE

TWO TABLETS THREE TIMES DAILY

PACKING

BOTTLES OF 40 and 120

VIGEL PRODUCTS LTD., 14 PEPPER STREET, NOTTINGHAM

THE SAFEST AND BEST PREPARATION OF OPIUM

Nepenthe contains all the constituents of opium and has been prescribed for over 100 years. It has been found by generations of practitioners to be the best preparation of opium as it does not cause the unpleasant after-effects usually attributed to opiates. It can be given over a considerable period and the effect remains invariably constant.

Packed in 2-oz., 4-oz., 8-oz. and 16-oz. bottles, and for injection in ½-oz. rubber-capped bottles, sterile, ready for use.

NEPENTHE

Regd.

(FERRIS)

FERRIS & CO LTD

BRISTOL

Tel: 21381 Grams: 'Ferris' Bristol

A Varied Diet for Infants

Early mixed feeding for infants has been advocated by many paediatricians. Although milk remains the infant's staple food, finely minced meat, puréed vegetables, lightly poached eggs and grated cheese are added at an early age. Marmite is particularly recommended as a source of the B vitamins for babies and young children.

As children enjoy the taste of Marmite, it is easy to introduce it into their diet in the form of Marmite gravy which is poured over minced meat and sieved vegetables; for older children, Marmite can be spread lightly on rusks, toast or bread and butter. In cooking, Marmite is a useful addition to soups, stews and other savoury dishes.

MARMITE yeast extract

Literature on request

Special terms for packs for hospitals, welfare centres and schools

MARMITE LIMITED, 35 SEETHING LANE, LONDON, E.C.3.

PXE 5704

A new periodical published by S. Karger, Basel:

GERONTOLOGIA

Journal of Experimental Biological and Experimental Medical Research on Ageing

Editors:

F. VERZÁR, *Basel.* R. E. TUNBRIDGE, *Leeds.*
E. BOURLIÈRE, *Paris.* C. M. McCAY, *Ithaca, N.Y.*

From the Editorial: "This new journal is intended to be of service to all those who believe that experimental research can lead us to a better understanding of the process of ageing. When the analysis of the different functional and morphological factors of ageing has revealed the causes, then it may also be possible to influence the progress of ageing.

1 Volume (6 issues) every year. **82/-**

Distributed in the United Kingdom by

INTERSCIENCE PUBLISHERS, LTD.
88-90 Chancery Lane, London, W.C.2

IMPORTANT NEW EDITIONS

A SYNOPSIS OF SURGICAL ANATOMY

By **ALEXANDER LEE McGREGOR.** *Eighth Edition.* Pp. 820, with 766 illustrations. **32s. 6d.**, post 1s. 2d.

Presents in concise form the surgical aspects of anatomical facts of value to the senior student and practitioner. The remarkably clear diagrams with which the text is illustrated are invaluable. Thoroughly revised.

AN ATLAS OF THE COMMONER SKIN DISEASES

By **HENRY SEMON** and **ARNOLD MORITZ.** *Fifth Edition*, revised with the assistance of **H. T. H. WILSON.** Pp. 384, with 153 colour plates. **105s.**, post 1s. 9d.

Portrays from the living subject, and in natural colour, a collection of the dermatoses most frequently seen in the routine of out-patient practice. The text has been thoroughly revised and new plates have been added.

SYMPTOMS AND SIGNS IN CLINICAL MEDICINE

By **E. NOBLE CHAMBERLAIN.** *Sixth Edition.* Pp. 508, with 374 illustrations. **35s.**, post 1s. 6d.

Not only describes the common symptoms and physical signs of disease, but also takes the reader a stage further to the visualization of symptoms and signs as forming a clinical picture of a pathological process. Completely revised and many new illustrations added.

A SYNOPSIS OF CHILDREN'S DISEASES

By **JOHN RENDLE-SHORT.** *Second Edition.* Pp. 632. Illustrated. **38s.**, post 1s.

Assembles all the relevant facts tidily and in a small compass and is designed particularly for undergraduate students, general practitioners, and those taking the D.C.H. A careful revision brings the text right up to date.

DANGEROUS DRUGS REGISTER

Tenth Edition. **18s. 5d.**, *inclusive of postage and purchase tax.*

Designed particularly for medical men who dispense their own medicines. The register is used to record all Purchases, Sales, and Stocks of Dangerous Drugs. Each Drug is allocated a separate section and the whole is thumb-indexed. The register also contains extracts giving the salient points of the Dangerous Drugs Regulations which came into force recently.

JOHN WRIGHT & SONS LTD., BRISTOL

Fully Illustrated Brochure Free on Request

OPERATIVE SURGERY

Under the General Editorship of

CHARLES ROB, *M.C.*, M.CHIR., F.R.C.S. *and* RODNEY SMITH, M.S., F.R.C.S.

"The first two volumes of this large exhaustive work are excellent and have whetted our appetites for the other volumes. The essential feature of the new Operative Surgery is the incorporation of the maximum number of illustrations and the minimum of text. This is an ideal combination. . . . This is an outstanding work on operative surgery: it is novel, practical and portrays all that is best in British operative technique. It is a production of which British surgery may well be proud." *The British Journal of Surgery.*

". . . the illustrations, reach a high standard and the whole production provides a welcome testimony to the authoritative place which British surgery has attained."
British Medical Journal.

In Eight Volumes and Index Volume

110s. NET PER VOLUME INDEX VOLUME **40s.** NET

Carriage and packing extra.

Please send for the 28-page illustrated brochure.

BUTTERWORTHS · 88 KINGSWAY · LONDON, W.C.2

Showroom: **11-12 Bell Yard, Temple Bar, London, W.C.2**

TRYPTAR

Now Available on E.C.10

INDICATIONS:—
Whenever necrotic tissue is present as in Diabetic and Varicose Ulcers, Sinuses and Fistulas, second degree burns, carbuncles and furuncles, infected compound fractures, soft tissue abscesses, intrapleurally in empyema for liquefying pus.

PRESENTATION
Carton containing 1 vial 250,000 Armour Units Crystalline Trypsin and 1 vial Tryptar diluent. Also available for use as an Aerosol, each carton containing 1 vial 125,000 Armour Units Crystalline Trypsin and 1 ampoule of Diluent.

Pure Crystalline Trypsin

Samples and literature will be supplied on request

THE ARMOUR LABORATORIES
(Armour & Company Ltd.)
Hampden Park, Eastbourne, England

Telephone: Hampden Park 740
Telegrams: Armolab Eastbourne

A cough elixir for the relief of coughs associated with the upper respiratory tract

Over many years this elixir has proved to be one of the best of its kind in the treatment of troublesome and irritating coughs, and particularly acute and chronic bronchitis and cough associated with pulmonary tuberculosis. A ¼ grain of Codeine Phosphate in each fluid drachm has a mild analgesic effect and also helps to induce sleep. The cough reflex is depressed by the action of the Codeine and combined with Terpin Hydrate, Menthol and Pine Oil, together with other essential oils, the resulting elixir assists expectoration, is distinctly sedative and engenders a warming and soothing feeling immediately a dose has been taken.

ELIXIR OF TERPIN WITH CODEINE (WOOLLEY)

FORMULA: Codeine Phosphate B.P., ¼ grain. Terpin Hydras P.B.C., ¼ grain. Menthol B.P., 5/32 grain. Oil of Pumilio Pine B.P.C., 1/24 minim. Eucalyptol B.P.C., 1/16 minim. Glycerin B.P., 20 minims. Syrup B.P., 15 minims. Alcohol B.P. 90%, a sufficiency. Flavour and colour, a sufficiency. Water to 1 fluid drachm. DOSE: 1 to 2 teaspoonfuls diluted with water.

POISON P.I.

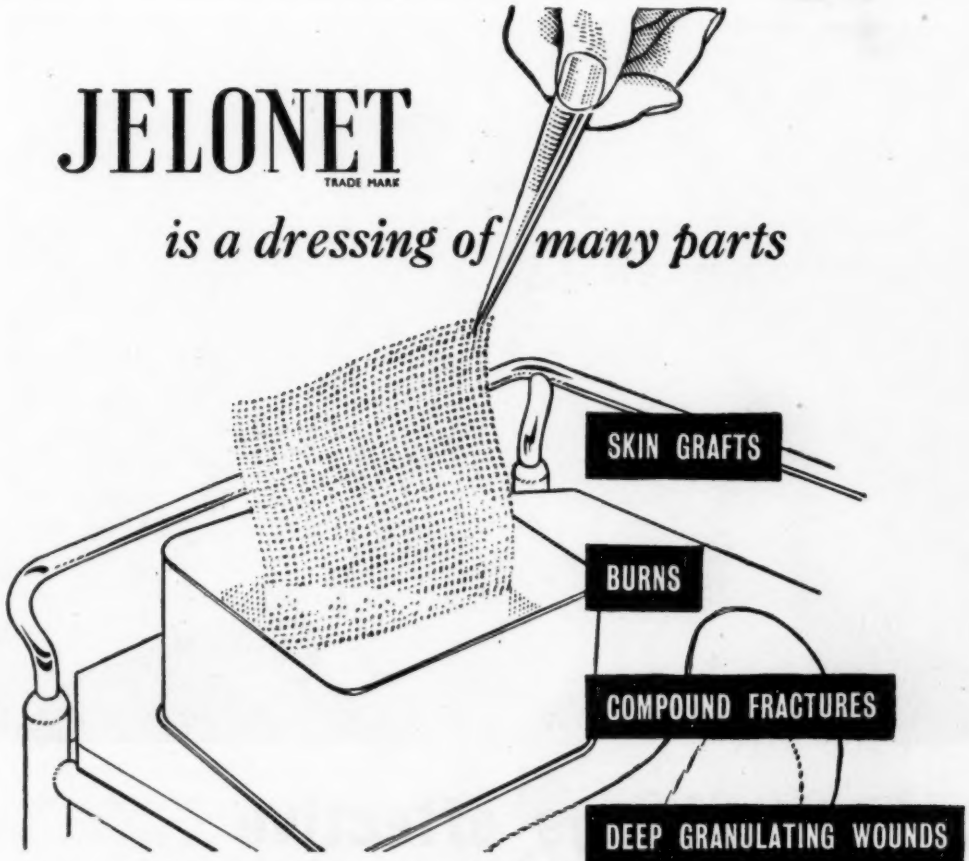
Available in bottles containing 10 fl.oz., 20 fl.oz., 40 fl.oz., 80 fl.oz., 8/6, 15/5, £1/8/8, £2/15/- each, less professional discount, quantities of 10 fl. oz. and upwards are Dispensing Packs exempt from Purchase Tax.

JAMES WOOLLEY SONS & CO., LTD., Victoria Bridge, Manchester 3
in association with J. C. ARNFIELD & SONS, STOCKPORT

WT 1

JELONET
TRADE MARK

is a dressing of many parts



'Jelonet' sterilized dressing, a Smith & Nephew product, is available in tins for immediate use in the hospital operating theatre or in your surgery. The non-adherent properties of 'Jelonet' protect the delicate epithelium and prevent dressing trauma, enabling healing of the wound to continue undisturbed. 'Jelonet' dressings are made from specially woven open-meshed gauze, thoroughly and evenly impregnated with soft paraffin containing 1.235 per cent. Balsam of Peru. Because 'Jelonet' is compatible with all antibiotics and medicaments, it is the ideal base for all combined dressings. Thus, by keeping a tin of 'Jelonet' handy, a non-adherent dressing and the desired medicament may be applied simultaneously.

AVAILABILITY *For prescription on N.H.S form E.C.10*
Tins of 5, 10 or 36 pieces (non interleaved)
Tins of 36 pieces (interleaved) Single pieces in sealed envelopes (sterilized for use in patients homes)
Each piece 3¼″ x 3¼″ (9.52 cms x 9.52 cms)

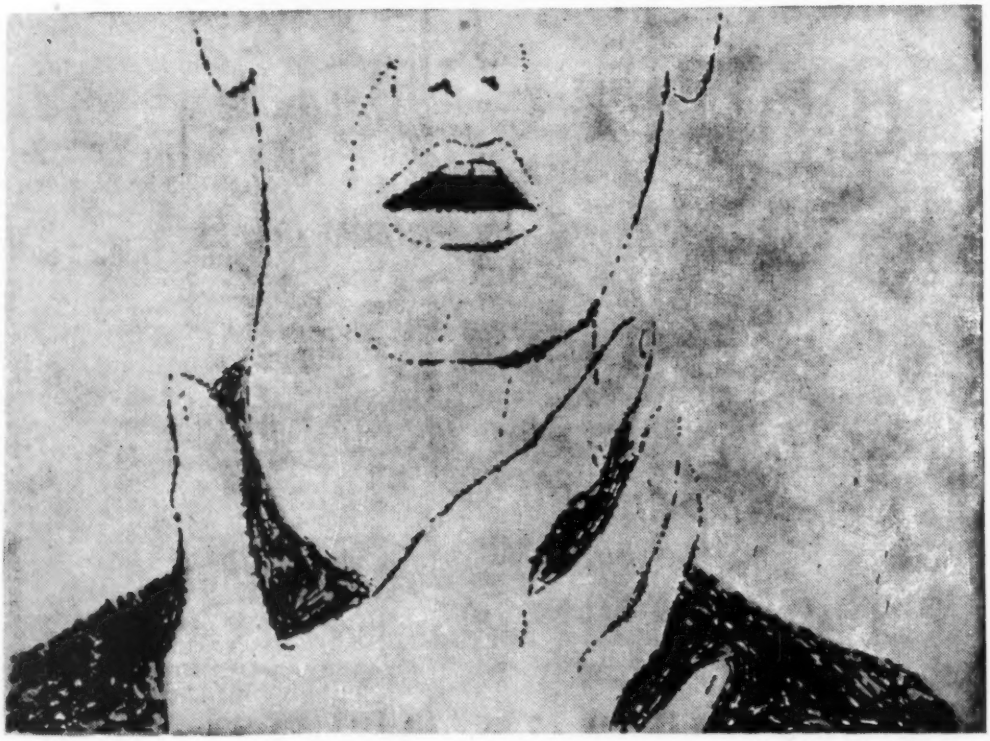
For hospital use only
8 yard strips (folded zig-zag) 3¼″ wide (7.31 m x 9.52 cms)

JELONET
TRADE MARK

PARAFFIN GAUZE DRESSING B.P.C

an S&N product

SMITH & NEPHEW LIMITED • WELWYN GARDEN CITY • HERTS



always effective

A problem with antibiotics is that resistant strains of micro-organisms tend to develop. Tyrothricin, the antibiotic in Tyrosolven, does not have this drawback.

Produced from strains of B. brevis, tyrothricin is always effective against a wide range of pathogenic bacteria — in fact no pathogenic organisms have been shown to become resistant to it.

This quality, combined with the fact that patients do not become sensitized to tyrothricin, ensures that it will remain a most effective oral antibiotic in cases of stomatitis, tonsillitis, and as a prophylactic against influenza and other throat infections.

Active principles: Tyrothricin 1 mg., benzocaine 5 mg.

Dose: One lozenge every hour till relief is obtained, then 1 lozenge every 3 hours.

Packing: Packs of 20 lozenges. Dispensing bottles of 250 lozenges supplied to chemists.

WARNER

Tyrosolven

TRADE MARK

WILLIAM R. WARNER & CO. LTD · POWER ROAD · LONDON, W.4.

6

Facts his doctor wasn't told...

Retired for the last three years, the patient complains that he's unable to keep pace with his gentle present-day routine. 'Says he's always tired . . . can't understand it as he's always been so active for his age. He doesn't say however that since his wife died, he's lost interest in his food . . . his attention to diet has been lacking and regular meals have been replaced by casual snacks.

GEVRAL Geriatric Vitamin—Mineral Supplement was evolved to enable doctors to treat just such patients—to provide a balanced ration of essential nutrients in the simplest form. The usual dosage is one capsule daily—and the GEVRAL formula is so comprehensive that this routine provides effective all-round supplementation. Indeed, for many elderly patients the result is a gratifying return of general well-being —and the rediscovery that life *is* worth living!

GEVRAL*

Capsules

Geriatric Vitamin—Mineral Supplement

Each capsule contains:

Vitamin A	5,000 I.U.	Ascorbic Acid (C)	50 mg.
Vitamin D (viosterol)	500 I.U.	Purified intrinsic factor concentrate 0.5 mg.	
Vitamin B_{12} as present in concentrated extractives from streptomyces fermentation	1 microgram.	Rutin	25 mg.
		Iron (as $FeSO_4$)	10 mg.
Thiamine mononitrate (B_1)	5 mg.	Iodine (as KI)	0.5 mg.
Riboflavine (B_2)	5 mg.	Calcium (as $CaHPO_4$)	145mg.
Niacinamide	15 mg.	Phosphorus (as $CaHPO_4$)	110 mg.
Folic Acid	1 mg.	Boron (as $Na_2B_4O_7.10H_2O$)	0.1 mg.
Pyridoxine HCl (B_6)	0.5 mg.	Copper (as CuO)	1 mg.
Calcium pantothenate	5 mg.	Fluorine (as CaF_2)	0.1mg.
Choline dihydrogen citrate	100 mg.	Manganese (as MnO_2)	1 mg.
Inositol	50 mg.	Mangnesium (as MgO)	1 mg.
Vitamin E	10 Units	Potassium (as K_2SO_4)	5 mg.
		Zinc (as ZnO)	0.5 mg.

another member of the

LEDERLE VITAMIN RANGE

*REGD. TRADEMARK

LEDERLE LABORATORIES DIVISION *Cyanamid* OF GREAT BRITAIN LTD. London. W.C.2 Lederle

Introducing...

'NOV-ALOCOL'

an *IMPROVED* antacid preparation

IN hyperacidity and peptic ulcer, the power of aluminium hydroxide to provide reliable buffering is well recognized.

In 'NOV-ALOCOL' aluminium hydroxide of improved acid-binding power is combined with magnesium hydroxide in such proportion that the mixture is neither astringent nor laxative.

'NOV-ALOCOL' provides *prompt* relief because its magnesium hydroxide content immediately acts on the excess acid already in the patient's stomach, while the buffering action of the aluminium hydroxide simultaneously provides protection against subsequent acid secretion.

'NOV-ALOCOL' is *safe*: in the dosage recommended, namely two tablets before or after meals according to the lesion, it will induce neither systemic alkalosis nor acid rebound.

Each tablet contains:

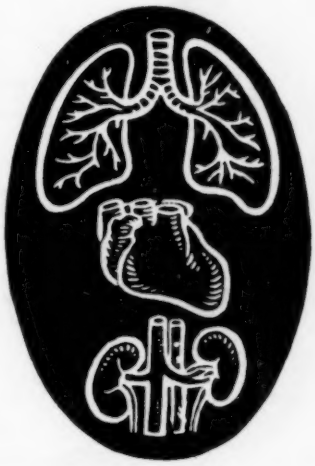
Aluminium hydroxide	0.375 g.
Magnesium hydroxide	0.125 g.
Excipient and flavouring	q.s.

PACK: Bottle of 50 tablets.

Sample and literature on request.

A. WANDER LTD., 42 Upper Grosvenor Street, London W.1.

M.398



a positive advance in theophylline therapy

- A pure chemical compound — theophylline ethanoate of piperazine
- Soluble — Stable — Neutral
- Seven times less toxic than theophylline itself
- Freely tolerated orally for long-term therapy without nausea, vomiting or gastric disturbance
- Intramuscular injections of Etophylate are painless

Etophylate is indicated for the treatment of cardiac, respiratory and renal conditions

ETOPHYLATE

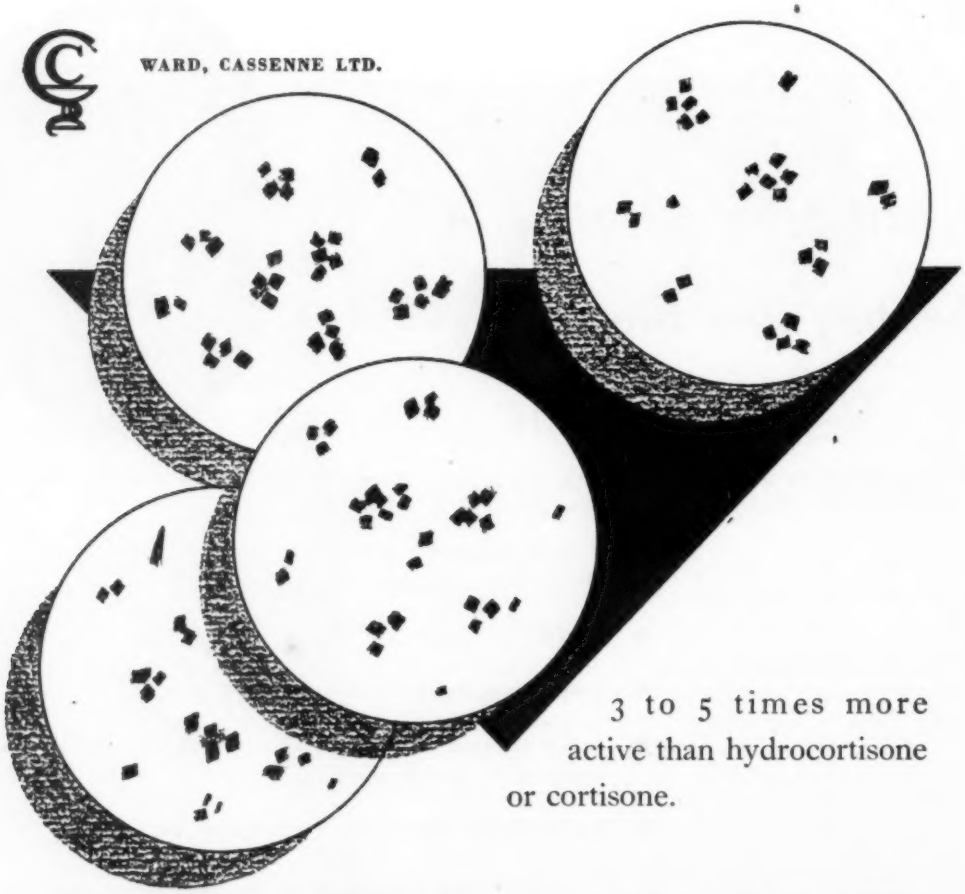
Clinical reports and samples gladly sent on request

Presentation: Tablets, 250 mg., in bottles of 25, 100 and 500.
Suppositories, 500 mg., in boxes of 12 and 144.
Ampoules, 500 mg. in 5 c.c., in boxes of 6 and 50.
500 mg. in 2 c.c., in boxes of 6 and 50.

ETOPHYLATE is also available with phenobarbitone and papaverine.

RONA LABORATORIES LTD
12-13 Molyneux Street, London, W.1. AMBassador 4437/8

WARD, CASSENNE LTD.



3 to 5 times more
active than hydrocortisone
or cortisone.

DELTALONE

REGD. T.M.

BUFFERED TABLETS

MAJOR INDICATIONS:
Rheumatoid Arthritis,
Severe allergies.

The antacids and the protective coating covering the Deltalone crystals increase therapeutic advantages by lessening the risk of gastric disorders.

DELTALONE

REGD TM

BUFFERED TABLETS: *At 5 mg. or at 1 mg.*

ADVANTAGES:

—Better gastric tolerance, due to the addition of antacids. These counteract the gastric hyperactivity often caused by these corticoids;

—a protective coating which covers each hormone crystal individually.

No sodium or water retention when usual therapeutic doses are prescribed.

FORMULA;

Prednisone (Delta-1-Cortisone)
Aluminium hydroxide
Magnesium trisilicate

WARD, CASSENNE LTD.

116 Victoria Street, London, S.W.1

Lepetit DIVISION

dispelling the element of doubt

TODAY—with so many antibiotics available—it is always sound practice to specify ACHROMYCIN *by name* whenever true broad-spectrum activity is desired. In this way you are completely assured that the patient receives precisely the treatment you intend. Offered now in no less than fourteen presentations, ACHROMYCIN tetracycline is particularly widely used in capsule form. On every capsule appears the name Lederle—your finest assurance of consistent antibiotic potency and unfailing dependability.

Capsules of 50 mg.—in vials of 25 and 100. Capsules of 250 mg.—in vials of 16 and bottles of 100 and 1000

ACHROMYCIN*

*REGD. TRADE MARK

TETRACYCLINE

Also available in the following forms: Ear Solution · Intramuscular · Intravenous · Ointment 3% · Ointment (Ophthalmic) 1% · Ophthalmic Powder Sterilized · Oral Suspension · Liquid Pediatric Drops SPERSOIDS* Dispersible Powder · Soluble Tablets · Syrup · Tablets · Troches

Lederle LEDERLE LABORATORIES DIVISION

Cyanamid OF GREAT BRITAIN LTD., London, W.C.2

in the chronic worrier

DRINAMYL

produces a mood of calm composure

Anxiety, apprehension or depression may cause or complicate a multitude of ills. An encouraging smile or a verbal pat on the back may help some patients to dismiss a baseless worry. But the chronic worrier needs more than encouragement if the troubles that shadow her life are to be met resolutely.

'Drinamyl' produces the peace of mind that such patients so desperately need. Smoothly and unobtrusively emotional tension is eased: harassment and anxiety give place to calm composure. The patient's competence to cope with problems is restored, and the response to treatment is improved.

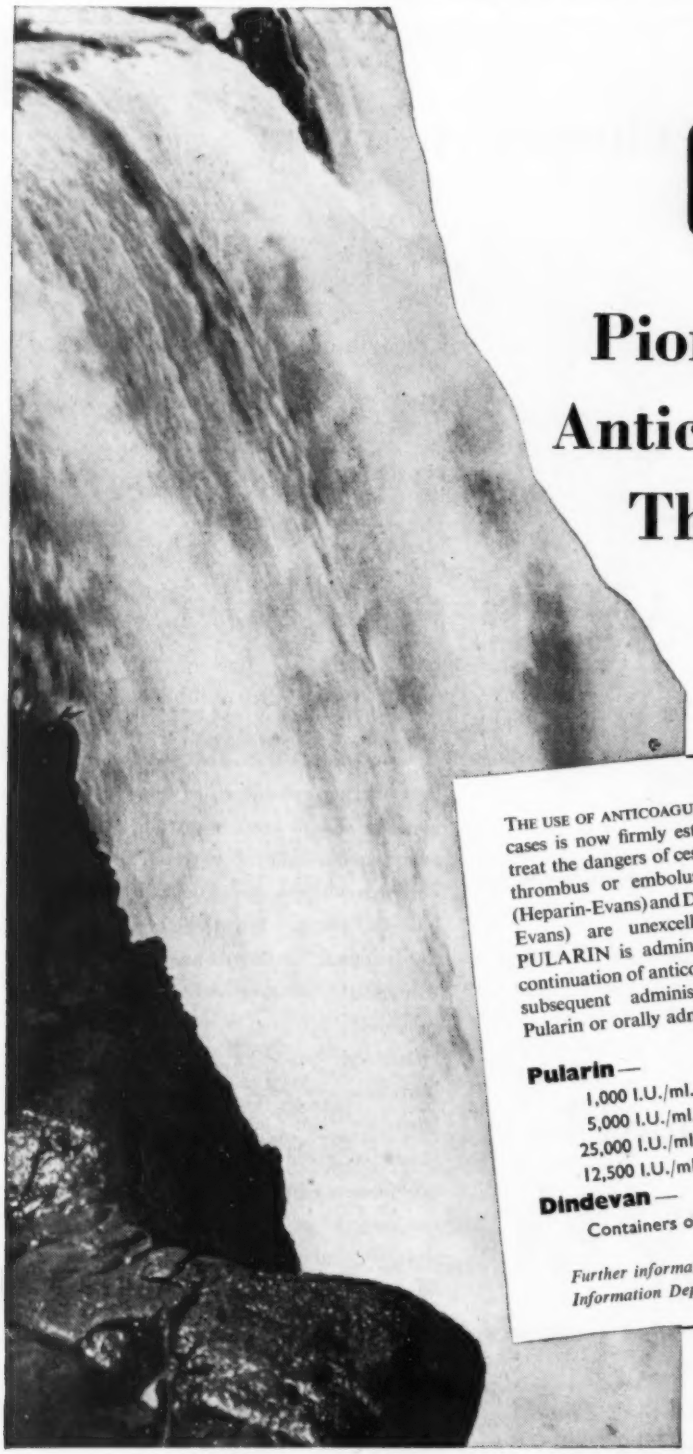
Drinamyl for the harassed patient

'DRINAMYL' TABLETS • 'DRINAMYL SPANSULE' SUSTAINED RELEASE CAPSULES

Smith Kline & French

represented by Menley & James, Limited, London S.E.5

DLP86



EVANS MEDICAL

Pioneers of Anticoagulant Therapy

THE USE OF ANTICOAGULANT THERAPY in suitable cases is now firmly established. To avoid or to treat the dangers of cessation of flow of blood by thrombus or embolus formation, PULARIN (Heparin-Evans) and DINDEVAN (Phenindione-Evans) are unexcelled. For emergency use PULARIN is administered intravenously, and continuation of anticoagulant therapy ensured by subsequent administration of intramuscular Pularin or orally administered Dindevan.

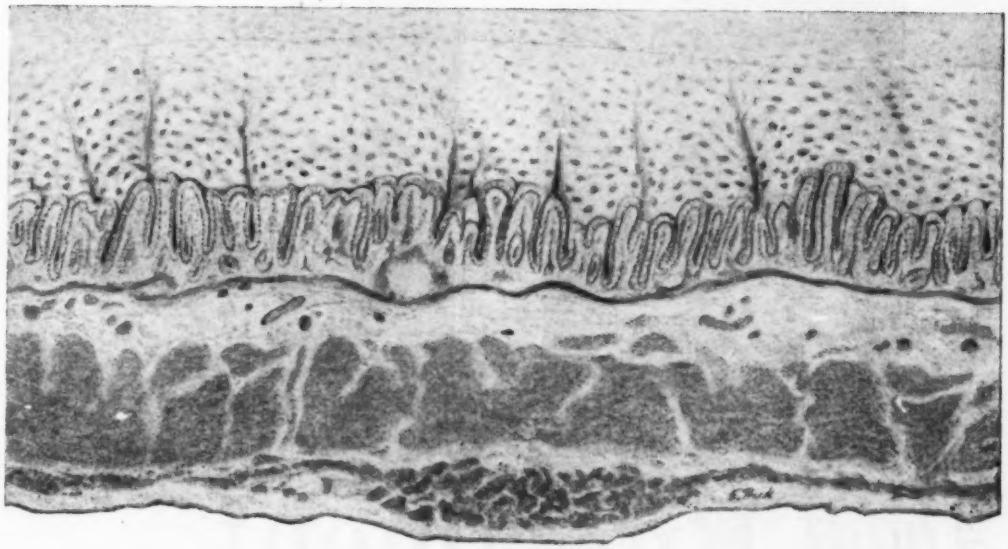
Pularin—
1,000 I.U./ml. 5 ml. rubber-capped bottle
5,000 I.U./ml. 5 ml. rubber-capped bottle
25,000 I.U./ml. 5 ml. rubber-capped bottle
12,500 I.U./ml. 1 ml. ampoule

Dindevan—
Containers of 25 and 100 tablets

Further information on request from Medical Information Department, Speke, Liverpool, 19

EVANS MEDICAL SUPPLIES LIMITED · LIVERPOOL AND LONDON

A PRODUCT OF SEARLE RESEARCH



Peristalsis and defaecation are physiological responses to gentle distension of the muscle layers of the intestines: administration of mucosal irritants may cause exaggerated responses attended by diarrhoea or colic.

The Physiological Action of Metamucil* in Correction of Constipation

Constipation is possibly the commonest of physical disorders, and perhaps the least likely to receive satisfactory treatment because of lay misunderstanding and the popularity of self-medication of the condition.

Metamucil provides a smooth non-irritating bulk which gently stimulates peristalsis and the defaecation reflex, and thus induces a normal physiological response. Each dose may be followed by an extra glass of liquid if desired.

Metamucil is free from all irritating material, is not habit-forming or harmful, and does not interfere with the assimilation of food or the absorption of either fat or water-soluble vitamins.

A product of the Searle Research Laboratories, Metamucil consists of equal amounts of refined psyllium from *Plantago ovata* seeds and dextrose.

Dosage: One rounded teaspoonful taken with 5 to 6 fluid ounces (¼ pt.) of cool water, milk, fruit juice or other liquid, one to three times daily. Metamucil is supplied in containers of 4 and 16 ozs.

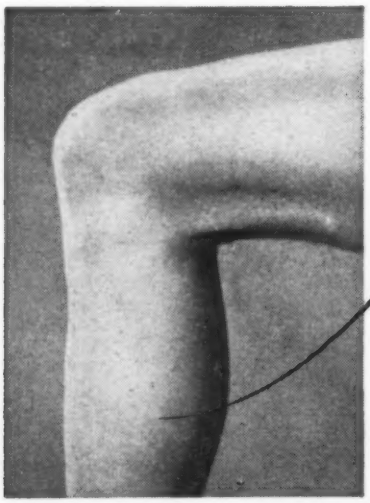
Further literature is available on request: G. D. Searle and Co., Ltd., High Wycombe, Bucks. Tel. High Wycombe 1770.

* *Registered Trade Mark.*

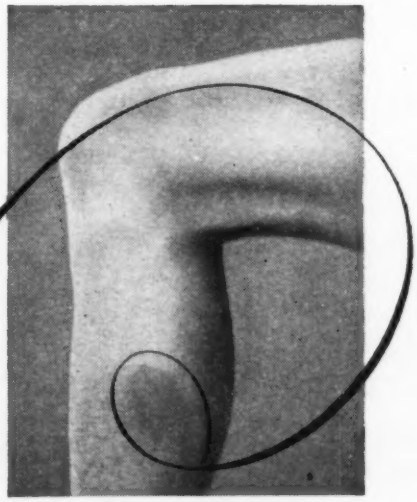
SEARLE

MM: P86

*N 15



Rubriment relieves pain in such conditions as muscular rheumatism, fibrositis, strains and sprains.



Some minutes after application the rubefacient action is apparent and lasts for many hours.

About Rubriment

the new long-acting rubefacient

Rubriment contains a new substance—the benzyl ester of nicotinic acid—which gives a long-lasting rubefacient effect. Pharmacological experiments have shown that even after prolonged and repeated application no damage or irritation to the skin was produced. Ten minutes after applying Rubriment there is a comforting feeling of warmth which lasts for many hours.

Clinical reports have been received of the efficiency of Rubriment for the relief of pain in such conditions as muscular rheumatism, lumbago, fibrositis, strains and sprains.

Rubriment may be used to give effective relief for unbroken chilblains.

Available in two forms

Rubriment (2.5% nicotinic acid benzyl ester and 0.1% Capsicin) is available either as a cream or as a liniment, both of which are non-greasy and free from unpleasant odour.

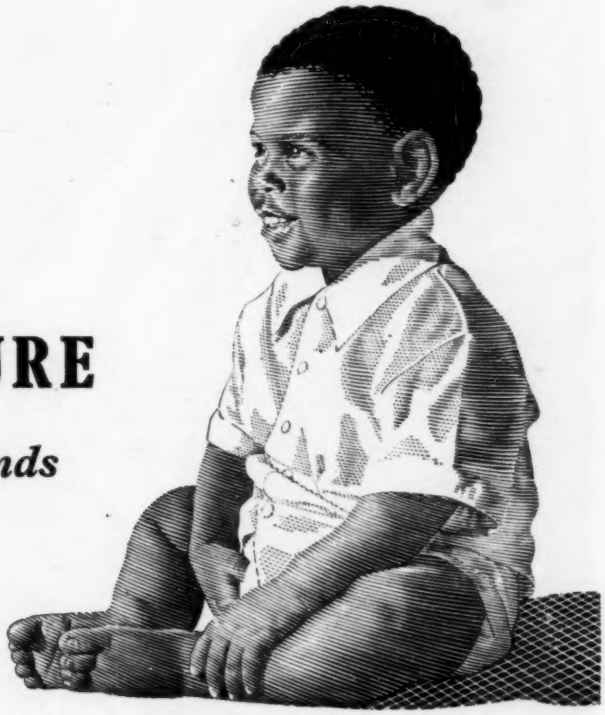
The cream is rapidly absorbed and needs only gentle application. *It is supplied in tubes of 20 G. (approx.).* Basic price to N.H.S. 2/2d.

The liniment lends itself to massage, if this is required. It is supplied in bottles of 2 fl. ozs. (approx.). Basic price to N.H.S. 3/-.

Rubriment is not advertised to the public and can be prescribed on form E.C.10.

Horlicks Limited

Pharmaceutical Division · Slough · Buckinghamshire



HIS FUTURE

is in your hands

Will this child ever reach his 15th birthday, or will he be a victim of malaria? His future is in your hands because malaria *can* be controlled.

Five years' experience has shown 'Daraprim' to be a highly effective agent in the control of the disease. Moreover, when administered to an entire community, it is capable of breaking the malarial cycle since it interrupts the development of the parasite in the mosquito.

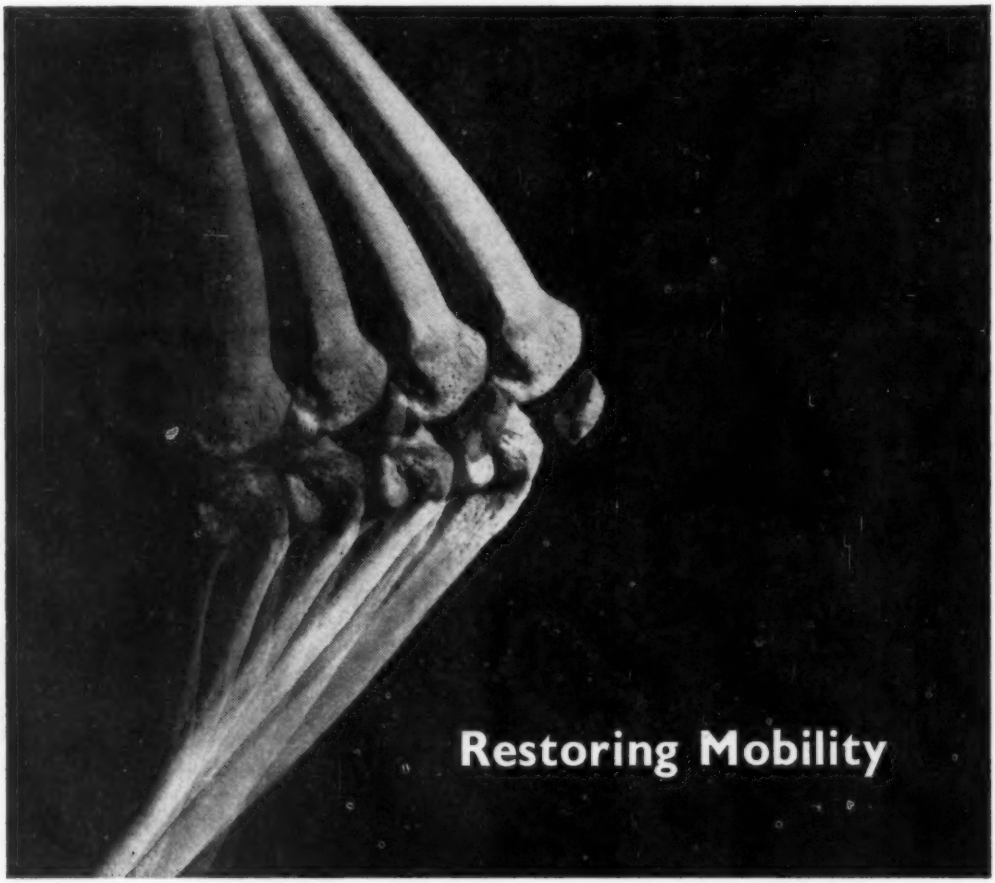
'Daraprim' is highly potent but tasteless and has proved an excellent suppressant in a weekly adult dosage of only 25 mgm. It is supplied in the form of 25 mgm. tablets in strip-packs of 6 and 30 for individual use, and in tins of 1,000 for larger users.

In the French Union, Tunisia and Morocco pyrimethamine is available under the trade name 'Malocide'.

'DARAPRIM'
BRAND
PYRIMETHAMINE

BURROUGHS WELLCOME & CO. (THE WELLCOME FOUNDATION LTD.) **LONDON**

Associated Houses:
AUCKLAND BOMBAY BUENOS AIRES CAIRO DUBLIN JOHANNESBURG KARACHI MONTREAL NAIROBI NEW YORK RIO DE JANEIRO ROME SYDNEY



in severe rheumatoid arthritis

Deltacortril*

brand of prednisolone

"... more effective than any previous drug in the control of the signs and symptoms of rheumatoid arthritis." *Lancet* (1955) ii, 1393

Tablets containing 5 mg. prednisolone in bottles of 10, 20, 100, 500, and 1,000. Tablets containing 1 mg. prednisolone in bottles of 100.

in less severe rheumatoid arthritis

Deltalgycortril*

prednisolone and acetylsalicylic acid

"Four hundred cases of various types of arthritis were treated . . . with notable improvement and with a minimum of side effects." *Ohio State Med. J.* (1956) 52, 722

Each tablet contains 0.5 mg. prednisolone and 5 grains acetylsalicylic acid. Available in bottles of 100.

Pfizer PFIZER LTD · FOLKESTONE · KENT

* *Trade Mark of Chas. Pfizer & Co., Inc.*

The original Lente Insulins

NOVO

Novo Lente Insulin

Novo Semilente Insulin

Novo Ultralente Insulin

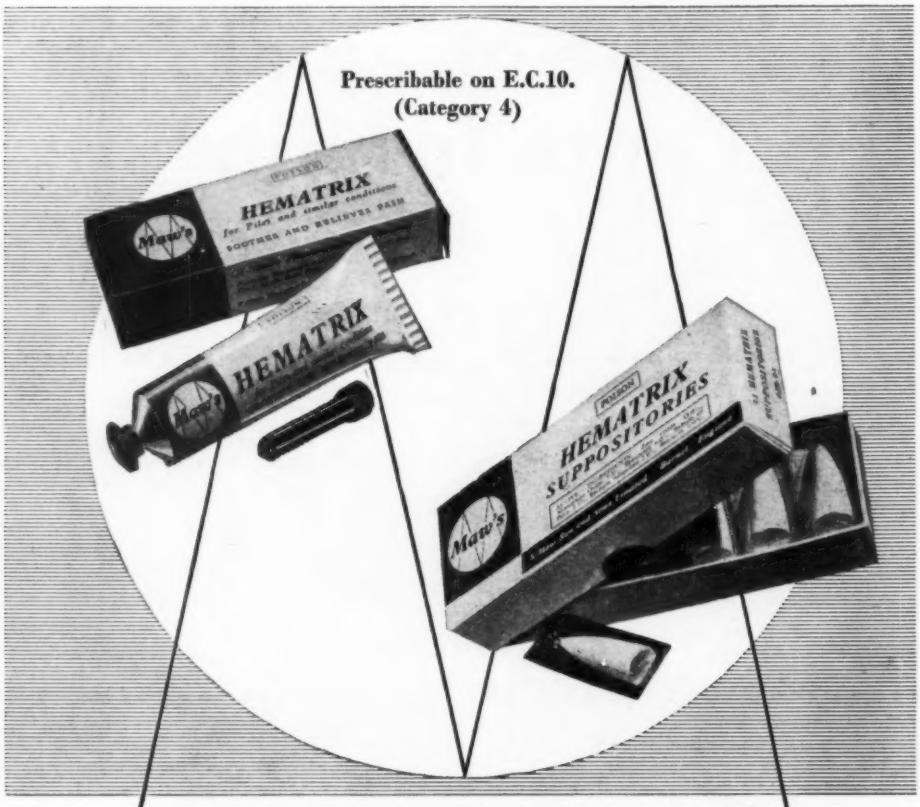
All available in 40 and 80 units per ml.

EVANS MEDICAL

EVANS MEDICAL SUPPLIES LTD.

SPEKE, LIVERPOOL 19 (HUNTS CROSS 1881)

London Office: Ruislip, Middlesex (Ruislip 3333)



For the treatment of haemorrhoids, pruritus ani, and inflammatory eczematous lesions in the anal region.

Hematrix Ointment

HEMATRIX is designed for the immediate relief of itching and localised pain through progressive treatment of the enlarged and varicose tissues by mild antacid astringent action. HEMATRIX acts promptly, effectively and thoroughly, promoting the disappearance of subjective symptoms.

Hematrix Ointment is presented in a tube with an applicator for internal use, and contains:

BENZOCAINE	6%
ALUMIN. OXIDE	7·5%
ZINC OXIDE	15%
BALSAM PERU	2·5%

Hematrix Suppositories

An alternative method with the inclusion of Bismuth Subgallate and Resorcin in the formula gives added value in pruritus and sepsis. Also gives maximum relief from pain and itching.

The distinctive straight-sided, conical shape is selected for giving prolonged contact with the anal canal, and greatest ease of insertion. The more gradual displacement of the orifice so permitted is of marked benefit where fissure is present.

Each suppository is plaquetted in transparent acetate and supplied in boxes of 12.

Maw's

S Maw Son and Sons Limited Barnet England

Well in the lead...

Penicillin-V Lilly is an effective oral penicillin that is stable in the acid form and is not inactivated by gastric secretions. For the first time in oral penicillin therapy, clinical results produced are consistently comparable with treatment by parenteral penicillin.

When the case calls for penicillin let Penicillin-V Lilly—the penicillin that "passes the acid test"—be your choice.

The average dose is 0.5 Gm. daily—125 mg. four times in 24 hours, increased in severe infections.

Available as

'Pulvules' 125 mg. (200,000 units), also 250 mg. and 60 mg. (Paediatric)

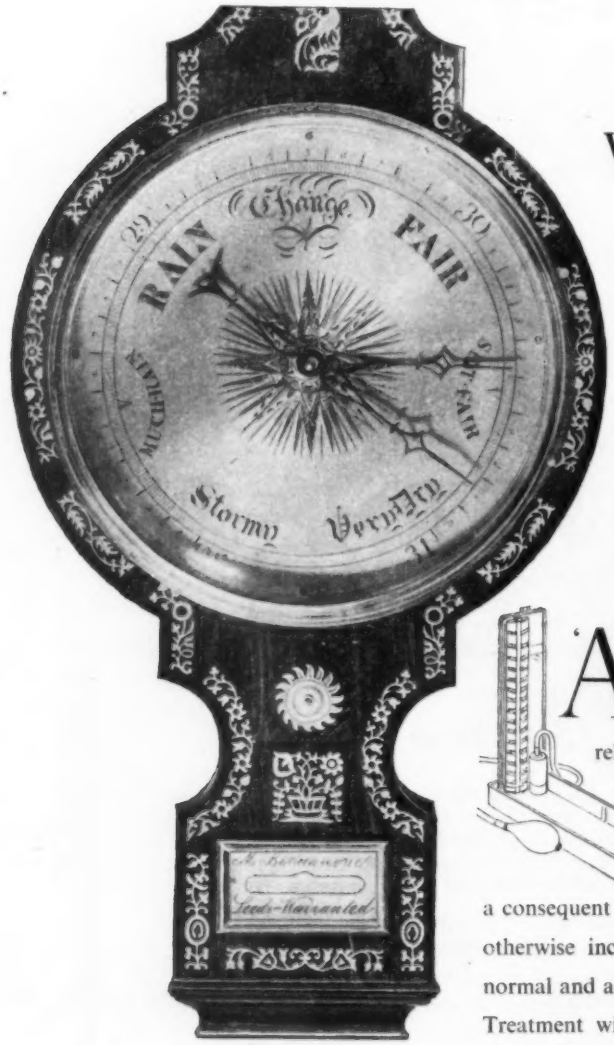
Suspension 62.5 mg. per 5 cc. For paediatric use.

and as TABLETS Penicillin-V-Sulpha, Lilly (Penicillin-V with Sulphonamides).

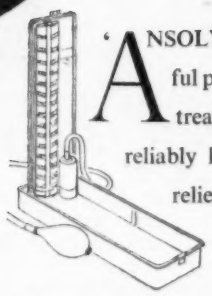
PENICILLIN-V LILLY

Lilly

ELI LILLY AND COMPANY LIMITED, BASINGSTOKE, ENGLAND



When **high** pressure is *not* a good sign



'ANSOLYSEN', one of the most successful preparations yet developed for the treatment of essential hypertension, reliably lowers blood pressure, provides relief from the distressing symptoms of hypertensive disease, arrests or reverses retinal damage with a consequent improvement in vision, and allows the otherwise incapacitated patient to resume a more normal and active life.

Treatment with 'Ansolysen' and reserpine may be combined with advantage: it is often possible to reduce the effective dose of 'Ansolysen', fluctuations in blood pressure are minimized, and parasympathetic side-effects are reduced.

PRESENTATIONS:

'ANSOLYSEN'

10 mgm., 40 mgm. and 200 mgm. tablets

0·5% and 2·5% solutions.

1% and 2·5% solutions with 0·5% ephedrine hydrochloride.

Detailed information is available on request.

'ANSOLYSEN'

trade mark *brand*

PENTOLINIUM TARTRATE

MANUFACTURED BY

MAY & BAKER LTD

An **M&B** *brand Medical Product*

MA3948

DISTRIBUTORS: PHARMACEUTICAL SPECIALITIES · (MAY & BAKER) LTD · DAGENHAM · ESSEX

reaching high levels FAST.....

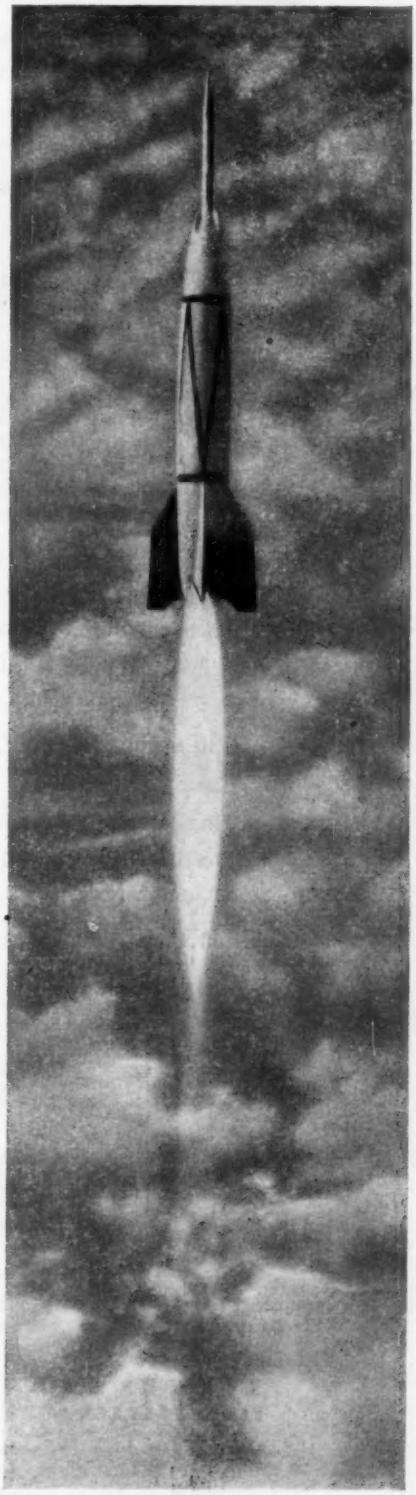
In oral penicillin therapy the most rapid and decisive results by mouth can be achieved if the antibiotic is speedily absorbed, gives a high initial destructive level, and is followed by a sustained inhibitory level at the infected focus. This is accomplished with ***soluble*** potassium pencillin G, the form which is absorbed from the alimentary tract with great efficiency. Such is the type of penicillin presented in Crystapen Tablets and Liquid—preparations that are readily taken and swift to act.

CRYSTAPEN
TRADE MARK

TABLETS (*Sugar-coated or plain*)
Two strengths: 200,000 units (125 mg.)
400,000 units (250 mg.) potassium penicillin G
per tablet in bottles of 12, 100.

LIQUID
200,000 units per fluid drachm. Bottles 2 fl. oz.

GLAXO LABORATORIES LTD. GREENFORD, MIDDX. BYRon 3434



In Hypertension

RAUWILOID

Reduces the pressure gradually and safely . . .

Of *proved* value in the treatment of mild to moderate hypertension, 'Rauwiloid' is a purified and standardized fraction of *Rauwolfia serpentina* in tablet form. It lowers elevated blood pressure *gradually*, slows the pulse rate, and so reduces cardiac effort. A calm, tranquil sense of well-being is induced, without drowsiness, and with little impairment of alertness. Dosage is not critical, and there are no important side-effects or contra-indications. Mental depression is unlikely to be encountered when 'Rauwiloid' is used in the recommended dosage. It is the medicament of choice for hypertension in its early stages, in order to arrest progression.

'Rauwiloid' contains 2 mg. of the active hypotensive alkaloids of *Rauwolfia serpentina* per tablet, undesirable constituents of the crude root being excluded by the extraction process.

Dosage is simple—two tablets taken at bedtime.

Full literature on request.

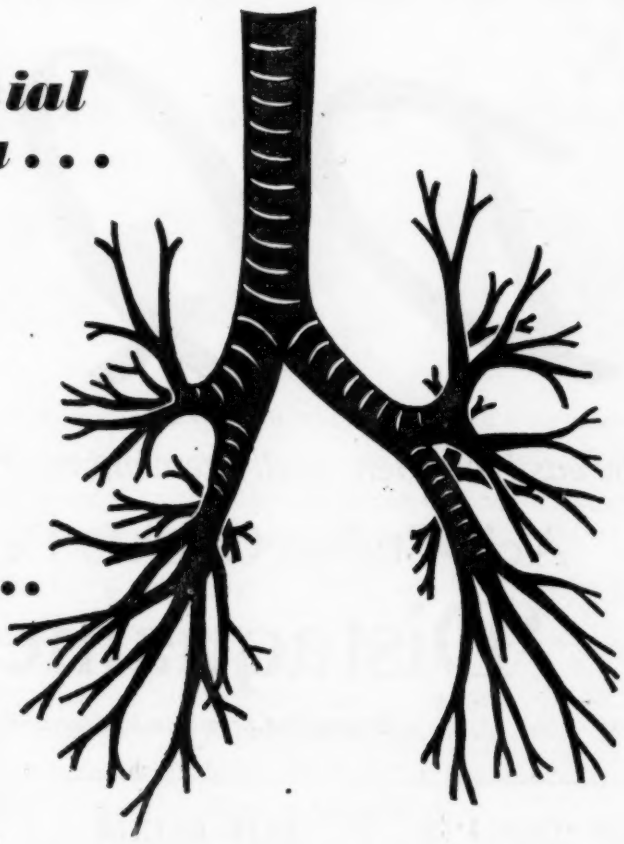
RIKER

'Rauwiloid' is a registered trade-mark. *Regd. Users:*

RIKER LABORATORIES LIMITED

LOUGHBOROUGH LEICS

Bronchial Asthma . . .



relieve the spasm . . .

with

*CHOLEDYL

A major advance in ORAL xanthine therapy

The most striking effects from the use of Choledyl are shown in the relief of the mild chronic state of bronchospasm and the reduction in the occurrence of acute attacks.
Choledyl provides theophylline blood levels up to 75 per cent higher than those obtained with oral aminophylline and it is essentially non-toxic in clinically effective dosage levels.

Choledyl is available in tablet form in two strengths, each tablet containing choline theophyllinate 100 mg. (coloured pink) or 200 mg. (coloured yellow). Supplied in bottles of 100 and 500 tablets.

MANUFACTURED IN ENGLAND

* *under licence from* NEPERA CHEMICAL CO. INC. NEW YORK, *owners of the trade mark & United Kingdom patent No. 736,443*

ALLEN & HANBURYS LTD · LONDON · E·2

TELEPHONE: BISHOPSGATE 3201 (20 LINES). TELEGRAMS: "GREENBURYS, BETH, LONDON"

C86/632/H

℞ DQV

The easily written, easily remembered contraction for

Acid-Stable ORAL Penicillin

'Distaquaine' V

tra le mark

Crystalline penicillin V, free acid

DQV TABLETS	DQV ELIXIR	DQV SULPHA
Each tablet contains 60 mg. penicillin V Bottles of 30, 200 and 1000	Each dose (½ fl.dr.) contains 30 mg. penicillin V Bottles of 2 fl. oz. (30 doses)	Each tablet contains 60 mg. penicillin V 0.30 gm. sulphadimidine 0.14 gm. sulphamerazine Bottles of 30, 200 and 1000

DOSAGE

Adults: 60 mg. or more every four hours
Children: Half the adult dose

Manufactured by

THE DISTILLERS COMPANY *(Biochemicals)* LIMITED

BROADWAY HOUSE, THE BROADWAY, WIMBLEDON, LONDON, S.W.19. *Tel.*: LIBERTY 6600.

owners of the trade mark 'Distaquaine'

PPH 30/56

'LANOXIN'

THE NEW NAME FOR THE ORIGINAL

DIGOXIN

When we discovered Digoxin in 1930 we used no other name to distinguish it. In those days, there was but one Digoxin—that issued by B.W. & Co. Today, it has become necessary to provide prescriber, pharmacist and patient throughout the world with that safeguard which a trade mark imposes . . .

THAT TRADE MARK IS 'LANOXIN'

NEW TITLE	'Tabloid' BRAND Digoxin *BECOMES* **'Lanoxin' BRAND Digoxin, B.P. (compressed)** Solution of Digoxin 'B.W. & Co.' *BECOMES* **'Lanoxin' BRAND Digoxin Oral Solution**
NEW PRODUCTS	**'Lanoxin' BRAND Injection** (for intramuscular or intravenous injection). *Boxes of* 6 × 2 *c.c. ampoules, each containing* 0·5 *mgm.* **'Lanoxin' BRAND Digoxin Pædiatric Elixir** *Bottles of* 2 *fl. oz., containing* 0·05 *mgm. per c.c.*
NO CHANGE OF TITLE	**'Wellcome' BRAND Injection of Digoxin** **'Wellcome' BRAND Sterile Alcoholic Solution of Digoxin**

N.B. Whenever oral Digoxin is ordered 'Lanoxin' may be dispensed

BURROUGHS WELLCOME & CO. (THE WELLCOME FOUNDATION LTD.) **LONDON**

27

A new approach to the 'cough problem'

'PECTAMOL' LINCTUS TRADE MARK

Each teaspoonful (3.55 ml.) contains 10 mg. of the citrate of the diethylaminoethoxyethyl ester of α : α-diethylphenylacetic acid (oxeladin)

- Pectamol acts by reducing the sensitivity of the vagal cough centre in the medulla.
- Reflex coughing is therefore decreased.
- Dry, unproductive cough ceases to annoy.
- Contains no opiates or their derivatives and has no hypnotic side effects.
- Does not produce nausea or constipation.
- Pleasant to take and well tolerated.

DOSAGE:

Adult—1 or 2 teaspoonfuls 4 times daily.
Child, 2 to 12 years—1 teaspoonful 4 times daily.
Under 2 years—½ teaspoonful 4 times daily.

Basic N.H.S. price:
Bottle of 60 ml. 2/6.
(plus purchase tax)

Descriptive literature and specimen packings will be supplied on request.

Medical Department

THE BRITISH DRUG HOUSES LTD. LONDON N.1

A CONCENTRATE OF HUMAN ANTIHÆMOPHILIC FACTOR
ITS USE IN SIX CASES OF HÆMOPHILIA

R. A. KEKWICK,
D.Sc. Lond.
READER IN CHEMICAL BIOPHYSICS IN THE UNIVERSITY OF LONDON

P. WOLF
M.B. Manc.
MEDICAL RESEARCH COUNCIL GRANTEE

From the Lister Institute of Preventive Medicine, London

UP to 1954, the only effectual method of treating hæmorrhage in hæmophiliacs was the transfusion of fresh blood, fresh plasma, or plasma separated from fresh blood and quickly frozen and stored at −20°C. These materials still have to be used in most cases, despite the danger that, because of the low antihæmophilic potency of human blood or plasma, however recently drawn, the circulation may be overloaded before hæmostasis can be achieved.

The preparation of antihæmophilic factor of very high potency from animal blood by Macfarlane et al. (1954) was a substantial advance. However, since such products consist of heterologous protein, they may provoke an antigenic response in the recipient—a dangerous state that precludes the repeated administration often essential in the management of hæmophiliacs.

It has long been evident that a potent preparation of human antihæmophilic factor would be very valuable, but the instability and the relatively low level of the activity in human plasma are disadvantages which have been difficult to overcome. In this paper we describe the preparation of a concentrate of human antihæmophilic factor, and its use in the treatment of six cases of hæmophilia, in some of which fairly radical surgery was undertaken.

Attempts to separate the antihæmophilic factor from other constituents of plasma have until recently been restricted by the lack of an adequate method for the assay of antihæmophilic activity. The development of the thromboplastin-generation test by Macfarlane and his colleagues (Biggs and Douglas 1953, Biggs et al. 1953, 1955), in providing a reliable in-vitro assay, made purification studies possible, and protein fractions possessing a very high antihæmophilic potency were separated, by salting-out techniques, from the plasmas of several domestic animals by the Oxford workers (Bidwell 1955). We have preferred to use an assay, devised by one of us (Wolf 1956), depending on the change induced in the prothrombin-conversion ratio of an artificial hæmophilic substrate by the addition of substances having antihæmophilic activity. This method was used to measure the activity of protein fractions separated from normal human plasma, and to study the effect of preparations of antihæmophilic factor on the activity in the plasma of hæmophilic patients undergoing treatment.

The antihæmophilic activity of citrated human plasma is reported to decrease rapidly unless the plasma is expeditiously separated from the formed elements of blood and then frozen to −20°C. We found that the antihæmophilic activity fell by 10–20% in sixteen hours, and by 50% after four days when trisodium-citrate plasma was stored at 2–4°C. Consequently speed of operation is a major consideration, at least in the early stages of fractionation, if reasonable yields of antihæmophilic factor are to be obtained.

During the serial fractionation of normal human plasma-proteins, using water-miscible solvents as precipitants, the first crude fraction removed contains most of the fibrinogen and some of the antihæmophilic factor (Kekwick and Mackay 1954). In the present experiments the conditions were modified to produce a maximal precipitation of the antihæmophilic factor in the fibrinogen fraction; the potency of this crude fraction was increased by simple ancillary treatment. The experiments leading to the definition of these conditions will be described elsewhere.

Method of Preparation

Blood taken into 100 ml. of 3% (*w/v*) trisodium citrate up to a total volume of 540 ml. is cooled as soon as possible to 2–4°C and centrifuged for an hour at 1500 r.p.m. at 0·0 ± 0·2°C preferably within three hours of the bleeding. The plasma is siphoned from the layer of red cells, centrifuged as before for thirty minutes, and poured cautiously from the slight residue of platelets and cells.

To the pooled twice-centrifuged plasma is added an equal volume of distilled water at 0°C. The diluted plasma is cooled to −0·5°C, and 11 vol.% of cold ethyl ether is added slowly with adequate stirring, the temperature of the mixture being maintained between −0·5°C and −1·0°C during this addition. When all the ether has been added, the mixture is allowed to equilibrate overnight (sixteen hours) at 0°C.

The clear supernatant solution is siphoned off as far as possible, and the residual precipitate and supernatant fluid are stirred to a uniform sludge, which is then centrifuged for thirty minutes at 1500 r.p.m. at 0·0 ± 0·2°C. The packed precipitate is suspended in 30% of the plasma volume of the following solution previously cooled to 0°C: sodium chloride 4·25 g. and trisodium citrate 1·85 g. made up to 1·0 litre with distilled water and 80 ml. of ethyl ether added—and centrifuged as before for thirty minutes. The washed precipitate is suspended in 50% of the plasma volume of distilled water at 0·0–0·5°C and centrifuged as before for forty-five minutes.

The twice-washed precipitate is then dissolved in sufficient of the following solution at 25°C to give a total volume equal to 10% of the initial plasma volume: sodium chloride 17·0 g. and trisodium citrate 7·4 g. made up to 1·0 litre with distilled water.

The precipitate, when gently agitated, dissolves completely in ten to fifteen minutes, giving a colourless and slightly opalescent solution. This is frozen immediately in 100-ml. quantities to −20°C in the final containers for freeze-drying, and the small samples required for assay are similarly treated if the assays cannot be made at once.

The equipment and solutions used were all sterile, and the preparative procedures were carried out under aseptic conditions (see Kekwick and Mackay 1954); consequently it was unnecessary to sterilise the final solution by filtration before freeze-drying. Nevertheless the product passed the sterility tests appropriate for substances used for parenteral injection in man.

Some Characteristics of Material used for Clinical Test

On the basis of in-vitro assay, the antihæmophilic activity in the final product has consistently been not less than 85% of the starting material, and the potency in terms of activity per mg. of protein has been 20–25 times that of fresh plasma.

The product is dissolved in a volume such that the resulting solution has approximately ten times the activity of normal plasma; the total protein content is about 2·2 g. per 100 ml. and the viscosity so low as to present no problem during administration. Such solutions can be held frozen at −20°C or dried from the frozen state with negligible loss in activity. Freeze-dried material has been stored at room-temperature for six months with only slight loss in activity, and it redissolves completely in twenty to twenty-five minutes when the appropriate volume of distilled water is added at room-temperature.

Like most of the preparations of antihæmophilic factor so far prepared in quantities adequate for clinical use, this human preparation contains a large proportion of fibrinogen; about 70% of the total protein appears in the clot formed when thrombin is added to a suitably diluted solution. The separation of fibrinogen from antihæmophilic factor by a procedure ensuring a good recovery of each is a problem of some complexity. The preparation was therefore tested clinically in its relatively

ASSAYS OF ANTIHÆMOPHILIC FACTOR (A.H.F.) DURING TREATMENT OF HÆMOPHILIA

Case no.	Preparation and vol. given (ml.)	Patient's plasma vol. (litre)	A.H.F. (units per ml.)		Increase in total circulating A.H.F. (10^3 units)	Total A.H.F. given (10^3 units)	A.H.F. accounted for (% of A.H.F. given)
			Before	After			
1 Episode 1a	EF. 29 200	4·63	5·6	6·3	4·5	11·2	40
,, 1b	EF. 29 200	3·82	2·1	4·3	9·3	11·2	83
,, 1c	Frozen plasma 420	3·82	1·6	2·9	6·1	7·3	84
,, 2	EF. 39 300	4·48	5·9	9·7	20·0	47·7	42
,, 3	EF. 43 300	4·15	4·4	11·0	30·7	32·7	91
2	FP. 20 180	2·26	0·62	6·0	13·2	20·5	65
3	EF. 29 } EF. 31 } 300	2·25	0·07	2·6	6·5	25·5	25
			After 23 hr. 0·8				
			,, 48 hr. 0·7				
4	EF. 31 100	1·09	0·56	4·9	4·8	9·3	52
			After 39 hr. 0·0				
5 Episode a	EF. 37 300	3·35	4·0	8·8	18·7	36·9	51
			After 2 hr. 7·9				
			,, 24 hr. 5·0				
,, b	EF. 37 200	3·48	2·2	7·9	21·4	24·3	88
			After 24 hr. 3·9				
6 Episode a	EF. 41 280	2·35	4·1	8·4	12·5	34·2	37
b	EF. 31 100	2·35	5·9	12·7	18·5	27·8	67
	EF. 39 100	..	..	..	..	..	..

Unless indicated otherwise, samples for A.H.F. assay were taken 10 minutes after the injection was completed.
Mean A.H.F. level of fresh normal citrate plasma 12·5 units (range 8–18) per ml.

impure state although, with a purification factor of only 20–25-fold, it was realised that 100 ml. of solution would be needed to produce an effect equivalent to 1000 ml. of fresh citrate plasma.

Clinical Results

The preparation of human antihæmophilic factor has been used with eminently satisfactory results in treating six cases including single and multiple tooth extractions, hæmorrhages into the stomach and joints, and radical surgery of the buttock and rectum.

Some details of the cases are given below. The effects of transfusion on the level of antihæmophilic factor (A.H.F.) in the patients' plasma are summarised in the accompanying table. The mean amount of A.H.F. found in fresh normal human citrate plasma is 12·5 units per ml. (range 8–18) (Wolf 1956).

In the first episode of case 1, presented to us as an emergency, a preparation of A.H.F. having only about half the activity of later ones was infused. The initial A.H.F. level in the patient's plasma was as high as 30–40% of normal probably as a result of the massive whole-blood and fresh plasma transfusions which had been given, but despite this he was bleeding into the stomach. The bleeding stopped after the infusion of A.H.F. concentrate. Of the total A.H.F. units given initially, 40% was found in the blood ten minutes after the completion of the transfusion, a large proportion presumably having been used up in producing hæmostasis. In later tests, when the patient was convalescent and not bleeding, 83% and 84% of the A.H.F. units injected as concentrate and as fresh plasma respectively, were demonstrable in the blood. At this time the patient's plasma-A.H.F. had fallen to a level commonly associated with moderately severe hæmophilia (about 15–20% of normal).

In the second episode of bleeding, about four months later, nearly 60% of the A.H.F. injected was immediately used up.

The third episode, when twenty-one roots and two teeth were extracted from his mouth, occurred after experience had been accumulated with other cases described below. A preoperative transfusion of 300 ml. of concentrate brought the plasma-A.H.F. to 11·0 units per ml., which is close to the mean normal level, and no undue bleeding took place during the operation. Next day, after the transfusion of 200 ml. of concentrate, the plasma-A.H.F. was 8·4 units per ml. Similar daily transfusions were given for two more days to maintain the plasma activity at this level. Unfortunately samples taken to establish this point were spoilt by the failure of a −20°C refrigerator. From the case-report it can be seen that the treatment was highly effective. The transfusion of one of the batches of A.H.F. concentrate (E.F. 45) was associated with pain in the back. No reason was found for this reaction, and subsequent recovery was complete and uneventful, the patient leaving hospital two weeks after the operation.

The results in cases 2–4 corroborate the efficacy of the concentrate. They tend also to confirm the finding that more of the injected antihæmophilic factor disappears in a patient bleeding at the time of transfusion than in a patient treated prophylactically before surgery is undertaken.

Major surgery involving highly vascularised tissue was undertaken in case 5, a mild hæmophiliac. The transfusions of concentrate were given to cover only the period of the operation and that immediately following, subsequent treatment being with whole blood. For four days after the operation there was no bleeding; but, about twelve hours after the dressings had been removed and the wound repacked, a ruptured vessel gave rise to hæmorrhage which necessitated the transfusion of whole blood; subsequent therapy was with stored whole blood to maintain the level of hæmoglobin.

In case 6 the healing of the gum after the tooth was extracted was delayed by an infection of the socket, presumably arising from the original abscess. Satisfactory hæmostasis was undoubtedly established in the early postoperative period. The patient developed urticaria after each injection of the concentrate; the idiosyncrasy was confined to this patient, for the three batches concerned had been administered to other patients without this complication.

Case-reports

Case 1.—A man, aged 37; weight 12 st. 5 lb. Mild hæmophilia, with no serious hæmorrhagic episode since adolescence and no permanent joint lesions. Family history of hæmophilia.

Episode 1

June, 1956.—Admitted to hospital with severe hæmatemesis. Initial treatment consisted of transfusion of whole blood and 2 pints of plasma (frozen when fresh) daily. After five days the daily 2-pint plasma transfusions were discontinued because the bleeding had stopped and circulatory failure threatened. Four days later there were further signs of bleeding, melæna stools, and a progressive fall in hæmoglobin. Treatment: 1–2 pints of whole blood and 2 pints of frozen plasma daily. On the

fourth day circulatory failure again threatened. On the fifth day 200 ml. of concentrate (batch EF. 29) was transfused (table, episode 1a). During the following two days 200 ml. of EF. 29 and 1 pint of whole blood were given daily. Since there was no further evidence of bleeding, therapy was discontinued after the second day, and the patient was then making a satisfactory convalescence.

A week later, the patient having recovered, an experiment was made to compare the change in A.H.F. level produced by the concentrate and by fresh plasma (table, episodes 1b and c). The A.H.F. level was determined before and after administering 200 ml. of concentrate EF. 29, and next day similar measurements were made before and after the transfusion of 420 ml. of fresh frozen plasma.

Plasma volume was estimated on the basis of 76 ml. of whole blood per kg. body-weight. Hæmatocrit during episode of bleeding was 25%, and during convalescence 40%. In estimating the plasma volume these values were multiplied by 0·90 to correct for trapped plasma and for non-uniform distribution of erythrocytes in the vascular system (Mollison 1956).

Episode 2

Oct. 31.—Admitted from outpatient department, which he attended for follow-up, having been found pale and with symptoms of a recent acute blood-loss. Hæmoglobin 45%; hæmatocrit 28%. Stool contained blood. Given 300 ml. concentrate EF. 39 immediately, followed by 2 pints of fresh blood. There was no transfusion reaction.

Nov. 1.—Given 900 ml. of fresh frozen plasma. In the next four days given a total of 1980 ml. of fresh frozen plasma. Melæna stools disappeared, and transfusion therapy discontinued. Patient made an uninterrupted recovery.

Episode 3

Nov. 21.—Dental extraction. Hæmoglobin before operation 60%, hæmatocrit 34%. Before operation 300 ml. of concentrate EF. 43 given intravenously (table, episode 3). No transfusion reaction. General anæsthetic given through intratracheal tube. Two teeth and twenty-one roots were extracted; one root had a medium-sized dental cyst at its base, which was curetted. Dried human thrombin was introduced into the cavities, which were then lightly packed with sterile alginate wool, and dental splints were then applied. No undue hæmorrhage occurred at the operation.

Nov. 22.—No hæmorrhage or oozing, but 200 ml. of concentrate EF. 45 was given to maintain A.H.F. level. Patient complained of pains in back during transfusion.

Nov. 23.—No hæmorrhage or oozing; 200 ml. of concentrate EF. 45 given, and patient again had pain in back during transfusion.

Nov. 24.—No hæmorrhage or oozing. Further 200 ml. of concentrate EF. 45 given. Pains in back and chest during transfusion relieved by intravenous pethidine.

Nov. 25.—No hæmorrhage or oozing during day, but oozing from one socket started in evening. During night 600 ml. of fresh frozen plasma arrested the oozing.

Nov. 26.—Given 600 ml. of fresh frozen plasma. Dental splints removed; no hæmorrhage or oozing.

Nov. 27 and 28.—No hæmorrhage or oozing but given 600 ml. of fresh frozen plasma each day.

Nov. 29.—Packed red cells from two pints of blood given. No hæmorrhage or oozing. End of transfusion therapy.

Dec. 4.—Patient discharged from hospital.

Case 2.—A man, aged 41; weight 8 st. Previous history of moderately severe hæmophilia, with joints showing chronic hæmorrhagic joint disease. Family history of hæmophilia. Admitted to hospital for extraction of tooth.

Immediately before the extraction he was given a transfusion of concentrate FP. 20 (180 ml.), and the tooth was extracted under gas and oxygen. After the extraction the cavity was packed with 'Oxycel' gauze, and a dental splint was applied, which was removed four days later. No bleeding whatsoever took place immediately after the extraction or subsequently up to the patient's discharge seven days later.

Laboratory findings.—Total blood volume (determined by Dr. J. H. Crookston using chromium-labelled red cells) 3650 ml. Plasma volume 2260 ml. Hæmatocrit 42·5%. Hæmoglobin 12·5 g. per 100 ml. For other data see table.

Case 3.—A man, aged 49; weight 8 st. History of severe classical hæmophilia, with multiple and severe chronic hæmorrhagic joint disease. Admitted to hospital with spontaneous hæmorrhages into both wrists, muscles of both forearms, and both knee-joints, occurring over previous three weeks. On admission there were signs of active bleeding into the knee-joints, the pain from which had prevented him from sleeping on the previous three nights.

He was given a transfusion of concentrates EF. 29 and EF. 31, total volume 300 ml. After an hour the pain in both knee-joints had subsided, and the same night he slept well without sedatives. His subsequent recovery was uneventful, and he was discharged from hospital after seven days.

Laboratory findings.—Blood volume measured as in case 2 with chromium-labelled red cells. Hæmatocrit 43·5%. Plasma volume 2250 ml. (See table.)

Case 4.—A boy, aged 6; weight 42 lb. Family history of hæmophilia. Admitted to hospital with injury to left leg; hæmorrhage into ankle and knee, calf muscle, and muscle of thigh.

After a transfusion of 100 ml. of concentrate EF. 31 he had a severe rigor lasting twenty minutes. Some of the same batch of concentrate had been administered to case 3 without untoward effect. A test for pyrogen was negative. Considerable clinical improvement followed the transfusion, and there was no further hæmorrhage.

Laboratory findings.—Plasma volume 1070 ml. estimated from weight and hæmatocrit. Hæmatocrit 28%. Hæmoglobin 61%.

Case 5.—A man, aged 28; weight 11 st. 6 lb. Previous history of mild hæmophilia, but no family history. Various episodes of bleeding from 1947 onwards. In July, 1956, while abroad, he had a purulent discharge from his rectum. An incision to drain the abscess led to a persistent discharge of pus into his rectum. He was flown to England and admitted to hospital for radical treatment.

Oct. 11, 1956.—Given 300 ml. concentrate EF. 37. Under general anæsthesia external drainage of the abscess was established. A broad tract was cut to the abscess by removing about $2^1/_2$ inches of buttock tissue and part of the superficial anal sphincter. There was no undue hæmorrhage during the operation (performed by Mr. G. A. Jemson). No hæmorrhage or further treatment until Oct. 15.

Oct. 15.—Given 200 ml. of concentrate EF. 37. Wound then inspected by surgeon and repacked. During the night hæmorrhage occurred and hæmoglobin dropped from 77 to 45% and hæmatocrit fell from 41 to 23%.

Oct. 16 to 22.—Patient received successively 3 pints of stored blood (Oct. 16), 2 pints of fresh blood (Oct. 17), 2 pints of fresh blood (Oct. 19), $2^1/_2$ pints of stored blood (Oct. 21), and 2 pints of stored blood (Oct. 22). After this no further hæmorrhage took place, and the patient made an uninterrupted recovery, being discharged on Dec. 20.

Laboratory findings.—Plasma volume estimated from weight and hæmatocrit. Hæmatocrit before first injection on Oct. 11 was 44% (uncorrected) and before second injection on Oct. 15 41% (uncorrected).

Case 6.—A boy, aged 18; weight 10 st. Moderately severe hæmophilia. No family history of hæmophilia. He had been admitted twenty-four times for episodes of bleeding, including hæmorrhages into joints causing limited movement of right knee and left elbow.

On Oct. 25, 1956, he was admitted for extraction of the first molar in the right lower jaw, which had an underlying abscess. Local anæsthetic. 280 ml. of concentrate EF. 41 was given immediately before the extraction and was followed by an urticarial rash. Difficult extraction, dental splint applied. Oozing from socket for an hour after extraction, and slight oozing during night. No further bleeding until evening of Oct. 28. On Oct. 29 100 ml. of EF. 31 and 100 ml. of EF. 39 were given, and dental splint was removed. Another urticarial rash developed, with pruritus. Rash was arrested with 50 mg. of promethazine. Bleeding was arrested for twenty-four hours.

After this, intermittent oozing from socket recurred and was controlled by digital pressure and the topical application of thrombin. On Nov. 8 the socket was packed. On Nov. 11 a substantial hæmorrhage took place. On Nov. 12 500 ml. of fresh whole blood followed by 500 ml. of fresh plasma was given. No further hæmorrhage. The patient was discharged on Nov. 18. The plasma volume (estimated with Evans blue) was 2350 ml.

Discussion

A potent preparation of antihæmophilic factor would obviously be of great value, in the management of hæmophiliacs, for preventing the development of

permanent joint lesions by the early treatment of young patients; for treatment in spontaneous hæmorrhagic episodes where its prompt administration would reduce the period of disability; and for reducing the risks of major surgery.

Our preliminary tests indicate that the concentrate of human antihæmophilic factor we have prepared may have considerable clinical value. The provision of a concentrate of which 100 ml. is equivalent in activity to 1000 ml. of fresh plasma, and which can be made available in a few minutes by the reconstitution of stable freeze-dried material, is a substantial advance in the treatment of hæmophilia. We hope to achieve a further 10-fold purification, so that the activity of 1000 ml. of fresh plasma could be injected in a volume of 10 ml. To do this without substantial loss in the total activity of the starting material is at present difficult. Meanwhile the potency of the present preparation is high enough to obviate the dangers of circulatory overloading during extensive treatment.

The antihæmophilic activity of some animal plasmas is considerably greater than that of human plasma, and consequently animal plasmas might be considered more advantageous for the production of potent antihæmophilic preparations. The purification factor for Bidwell's (1955) bovine preparations is as high as 100–400, compared with 20–25 for our human material. However, the hazard of allergic reactions following the repeated administration of heterologous proteins is a serious restriction in the use of these substances—a restriction which does not apply to material from human plasma. In the literature there are reports of hæmophiliacs becoming resistant to therapy after repeated treatment over long periods even with human plasma and products derived from it; the significance of many of these reports is difficult to assess in the light of our present knowledge of the clotting mechanism. It is worth emphasising in view of this that in case 1, in which repeated infusions of our preparation were given over a period of five months, no resistance to therapy appeared, and laboratory tests at the end of the period did not detect any evidence whatsoever of the development of even traces of a specific circulating anticoagulant.

The problems arising in the fractionation of animal plasma-proteins are simplified because the technique can be directed to the recovery of a single constituent without attempting to conserve the others. In the large-scale fractionation of so valuable a commodity as human plasma such an approach is indefensible; the isolation of any particular constituent must be fitted into an overall scheme of fractionation which ensures a reasonable yield of as many as possible of the other constituents, and the freedom of design is inevitably restricted. Moreover, in view of the relatively low concentration of antihæmophilic factor in human plasma, any fractionation stage which does not lead to a recovery of at least 90% of the initial activity is not acceptable.

The advantages which arise from the use of water-miscible solvents for the fractionation of aqueous protein mixtures are well known, but the enhanced flexibility introduced by the additional variable of solvent concentration and the ease with which an aseptic fractionation technique can be operated are worth emphasis. Even so, it is necessary to proceed cautiously, for many proteins may be altered by the presence of solvents, even at low temperatures (0 to −10°C) and so lose their characteristic biological properties. The antihæmophilic factor, in our experience, is especially susceptible to such influences, though whether the loss in activity which can occur is due to some intrinsic instability, or to a secondary modifying effect induced by the action of solvents on other plasma constituents, is at present difficult to decide. However, after aseptic isolation and drying from the frozen state, the human antihæmophilic preparation loses relatively little activity over several months. In this respect it has some advantage over the animal preparations, which need sterilising after separation. Thus Bidwell (1955) could not use Seitz or Berkefeld filtration for sterilising bovine preparations because of the loss in activity on the filters and had to sterilise by ultraviolet light. Variable and high losses were also encountered when bovine preparations were freeze-dried; this has not happened with our human preparations.

In order to obtain a measure of the problem involved in the management of hæmophiliacs, let it be assumed on the basis of our limited clinical experience that a single crisis in a hæmophiliac might on the average be countered by the injection of an amount of antihæmophilic factor equivalent to that in 2 litres of fresh human plasma. This in its turn represents the plasma derived from about seven blood donations. The total number of hæmophiliacs in the country is probably close to 2000; consequently to provide each with a single injection each year would require 14,000 blood donations. This figure represents about 2% of the current total annual donations. The processing of the plasma from 14,000 blood donations by the procedure found necessary to ensure a maximum recovery of antihæmophilic factor presents a formidable problem, whose solution is not yet clear. These difficulties arise mostly because of the speed with which the processing must be done; we hope that further work may reduce them, but exploratory experiments have already indicated that neither the use of non-wettable surfaces in collecting the blood nor the use of edetic acid (' Sequestrene ') in anticoagulant mixtures reduces the rate at which antihæmophilic activity is lost in drawn blood or in plasma.

Summary

A preliminary clinical trial in six cases of hæmophilia indicates that the intravenous injection of a concentrate of human antihæmophilic factor arrests internal and external bleeding, and permits surgical intervention without abnormal bleeding.

The concentrate of human antihæmophilic factor, which contains not less than 85% of the initial activity, is separated aseptically from fresh citrated normal human plasma; the purification factor is 20–25-fold per gramme of protein.

Solutions of the concentrate may be dried from the frozen state without significant loss in activity, and the activity of the freeze-dried material is retained for several months with only slight loss.

The dangers of circulatory overloading during treatment are largely avoided with this preparation since 100 ml. is equivalent in antihæmophilic activity to 1000 ml. of fresh normal citrate plasma.

Our thanks are due to Dr. J. V. Dacie and Dr. J. H. Crookston of the Postgraduate Medical School of London, Dr. C. Holman of Lewisham Hospital, and Dr. K. E. Saunders of Dulwich Hospital for their coöperation and assistance during the clinical trials.

We wish also to thank Mr. L. Vallet, B.A., and Miss S. L. Evans, B.SC., of the blood-products laboratory, Lister Institute, Elstree, Herts, for undertaking the pilot plant production of the antihæmophilic-factor preparations used in the clinical trials, and Dr. J. D. James and Dr. R. A. Zeitlin for their invaluable coöperation.

One of us (P. W.) is indebted to the Medical Research Council for personal and research grants.

REFERENCES

Bidwell, E. (1955) *Brit. J. Hæmat.* **1**, 35, 386.
Biggs, R., Douglas, A. S. (1953) *J. clin. Path.* **6**, 23.
— — Macfarlane, R. G. (1953) *J. Physiol.* **119**, 89.
— Eveling, J., Richards, G. (1955) *Brit. J. Hæmat.* **1**, 21.
Kekwick, R. A., Mackay, M. E. (1954) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 286.
Macfarlane, R. G., Biggs, R., Bidwell, E. (1954) *Lancet*, i, 1316.
Mollison, P. L. (1956) Blood Transfusion in Clinical Medicine. Oxford; p. 61.
Wolf, P. (1956) *Brit. J. Hæmat.* **2**, 386.

STAPHYLOCOCCAL BRONCHOPNEUMONIA IN DEBILITATED HOSPITAL PATIENTS

A REPORT OF FOURTEEN FATAL CASES

G. A. GRESHAM
M.A., M.B. Camb.
DEMONSTRATOR IN PATHOLOGY
M. H. GLEESON-WHITE
M.A. Camb., M.B. Lond.
UNIVERSITY BACTERIOLOGIST TO ADDENBROOKE'S HOSPITAL, CAMBRIDGE
From the Department of Pathology, University of Cambridge

IN May, 1955, a patient in a male medical ward died unexpectedly while convalescing from coronary thrombosis, and at necropsy death was found to be due to bronchopneumonia. Although a heavy growth of a coagulase-positive *Staphylococcus aureus* was obtained from the lungs of this patient, the histological appearance of the lung lesions differed greatly from those seen in the lungs of patients dying of a staphylococcal pneumonia. Instead of multiple foci of necrosis scattered throughout the lungs, progressing in places to frank abscesses, most of the affected bronchioles and alveolar ducts were intact but surrounded by extensive areas of hæmorrhagic œdema. There was, in fact, a striking resemblance between the microscopical appearance of these lesions and those found in patients with epidemic influenza dying of fulminating secondary staphylococcal bronchopneumonia.

During the following eighteen months the lungs were examined both histologically and bacteriologically in sixty cases in which a pulmonary infection was suspected at necropsy, and thirteen further examples of this type of staphylococcal bronchopneumonia were found; in only four of these thirteen patients had any kind of acute infection of the lungs been suspected during life.

Illustrative Case-reports

Case 1.—A man, aged 76, was admitted to hospital on May 1, 1955, with an attack of severe precordial pain of 24 hours' duration and was treated as a case of coronary thrombosis. Next day, although he was relieved of his pain, his temperature had risen to 102°F, and crepitations were heard at the bases of both lungs. Crystalline penicillin 500,000 I.U. was given 6-hourly together with streptomycin 1 g. 12-hourly, but he became semiconscious and, after repeated attacks of cyanosis of varying degree and duration, he died on the fifth day after admission to hospital.

Necropsy findings.—There was bilateral lower-lobe bronchopneumonia with thin pus in the bronchi and bronchioles. Histological examination of the lungs showed acute bronchopneumonia of the lower lobes, with many bronchioles and alveoli full of pus cells and clumps of gram-positive cocci, the surrounding alveoli being filled with red cells and fibrin or œdema fluid. Areas of fibrosis were found in the lateral wall of the left ventricle; the coronary arteries showed severe atheroma, but there was no evidence of thrombosis. A heavy growth of *Staph. aureus* was obtained from the lungs.

Case 2.—A man, aged 63, was admitted to hospital on June 9, 1955, with acute retention of urine. His bladder was decompressed, and he was given sulphadimidine 1 g. 8-hourly. 2 days later a transvesical prostatectomy was done, and his immediate postoperative progress was satisfactory. On the 2nd day after operation his temperature rose to 100°F, and he was given crystalline penicillin 500,000 I.U. 8-hourly together with streptomycin 0·5 g. 12-hourly for a suspected infection of the urinary tract. A week later his temperature was still raised, when he collapsed suddenly with profuse hæmaturia, his blood-pressure falling from 220/150 to 100/60 mm. Hg. In spite of the transfusion of three pints of blood he remained in a state of shock and died suddenly 9 days later, immediately after an attack of hyperpnœa. The blood-urea level, 3 days before death, was 331 mg. per 100 ml.

Necropsy findings.—There were areas of recent bronchopneumonia in both lower lobes, and the bronchi contained pale-brown pus. Histological examination of the lungs showed areas of bronchopneumonia in the lower lobes, almost amounting in places to abscesses, in which there were many clumps of gram-positive cocci; the alveoli adjacent to these areas were filled with red cells and fibrin. The prostatic cavity appeared to be healing satisfactorily, but the boundary zone of both kidneys was blurred, suggesting distal tubule nephrosis, which was confirmed microscopically. A heavy growth of *Staph. aureus* was obtained from the lungs.

Case 3.—A woman, aged 68, was admitted to hospital on May 14, 1955, with 7 days' history of occipital headache, giddiness, vomiting, and increasing drowsiness. A cerebral tumour or virus encephalitis was diagnosed, and a 10-day course of chloramphenicol 0·5 g. 6-hourly was begun 2 days later. On June 1 a urinary infection was suspected and treated with streptomycin 1 g. 12-hourly and erythromycin 0·2 g. 6-hourly. A non-productive cough began on June 29 and was followed 4 days later by the expectoration of copious amounts of yellow sputum and by cyanosis and coldness of the extremities; the patient died the same day. Radiography shortly before death showed a bronchial carcinoma.

Necropsy findings.—A carcinoma was found arising from a bronchus leading to the left upper lobe, and metastases were present in the hilar lymph-nodes. There was a quantity of pus in the bronchial tree, and areas of bronchopneumonia in both lower lobes contained large clumps of gram-positive cocci. The alveoli surrounding these areas of bronchopneumonia contained many red cells and much fibrin; there were recent thrombi in several pulmonary veins. A metastasis was also found in the right cerebellar hemisphere. *Staph. aureus* was isolated in pure culture from the lungs.

Case 14.—On Nov. 28, 1956, a man fell from his bicycle and was admitted to hospital semiconscious. He had a severe lacerated scalp wound, but no fracture of the skull or abnormality of the central nervous system was discovered; his blood-pressure was 120/80 mm. Hg. He was given sulphadimidine 1 g. 6-hourly, crystalline penicillin 500,000 I.U. 8-hourly, and streptomycin 1 g. 12-hourly. For the next 6 days he remained semiconscious, by the end of which time he had developed flaccid paresis of his right arm. 2 days later his temperature, pulse-rate, and respiration-rate started to rise, and diminished air entry at the base of the right lung was found. Next day he collapsed suddenly with severe cyanosis, dyspnœa, and coldness of the extremities, temperature 105°F, pulse-rate 160, respirations 40 a minute, and blood-pressure 60/? mm. Hg. He died an hour later.

Necropsy findings.—The trachea and main bronchi contained pus in which were large numbers of cocci (fig. 1), and

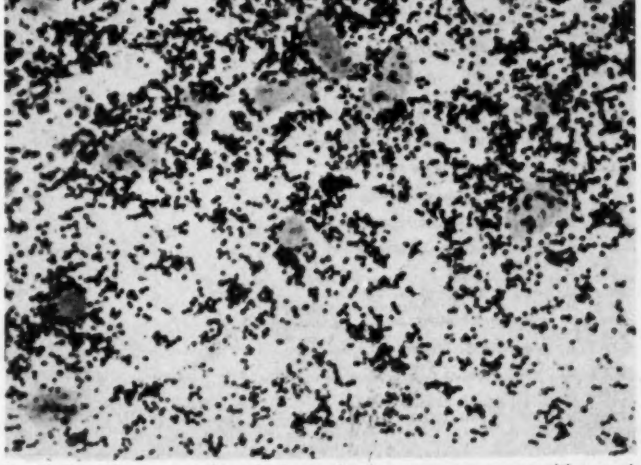


Fig. 1—Case 14: smear of tracheal pus showing numerous gram-positive cocci and a few epithelial squames. (Gram. × 1050.)

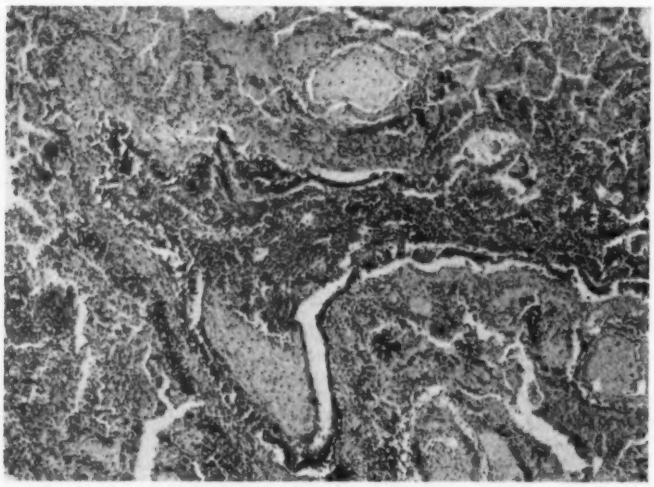


Fig. 2—Case 14: section of lower lobe showing bronchiole filled with pus and surrounded by alveoli filled with red cells. (Hæmatoxylin and eosin. × 65.)

areas of bronchopneumonia were seen in both lower lobes. The bronchioles were filled with pus and clumps of gram-positive cocci. Surrounding alveoli contained hæmorrhagic œdema fluid (fig. 2). A heavy growth of *Staph. aureus* was obtained from all lobes of the lungs.

Post-mortem Findings

Histology

The microscopical appearance of the pneumonic areas in all these cases was similar. There were many polymorphs and clumps of gram-positive cocci in the affected bronchioles and alveolar ducts, and the surrounding alveoli were filled with hæmorrhagic œdema fluid (fig. 2). In three cases thrombi were found in some of the pulmonary vessels but never in sufficient numbers to explain the hæmorrhagic nature of the œdema fluid. More advanced lesions were seen in two cases; an empyema thoracis in case 9, and numerous small abscesses just visible to the naked eye in case 13.

Bacteriology

Cultures were obtained from the lungs at necropsy by the simple method of thrusting swabs blindly into the parenchyma of each lobe through small incisions made with a sterile scalpel in the overlying pleura, which had first been carefully sterilised with a branding-iron. The swabs were plated out on 10% horse-blood digest broth-agar and "chocolate" agar, after which the swabs themselves were planted in tubes of Robertson's cooked-meat medium. All cultures were incubated aerobically overnight, and the amount of growth of the various organisms isolated was roughly estimated and recorded.

A heavy growth of *Staph. aureus* was obtained from the lungs of eleven of these patients but, in view of the large numbers of gram-positive cocci also seen in sections from the lungs of the three other patients, the poorer growth of staphylococci obtained from them was probably due to the crude method of sampling.

Common intestinal organisms were also grown from the lungs of all but two patients. The presence of those organisms was thought to imply the agonal inhalation of stomach contents, and they were not regarded as playing any active part in the genesis of the type of bronchopneumonia described here. This view is supported by the isolation of intestinal organisms from the lungs at necropsy of forty-three out of forty-seven other patients suspected of having a pulmonary infection. In eighteen of these there was no histological evidence of any acute infection of the lungs, and only a very low-grade bronchopneumonia with no hæmorrhagic œdema was found in the twenty-five other patients.

The sensitivity of the strains of *Staph. aureus* isolated from the lungs of thirteen of the fourteen patients to antibiotics was determined by a simple filter-paper strip

BACTERIOLOGICAL FINDINGS

Case no.	Sex	Age (yr.)	Primary condition	Post-mortem lung cultures				Sensitivity to antibiotics of *Staph. aureus* isolated from lungs					Chemotherapy in hospital
				Staph. aureus	Non-haemolytic streptococci	Coliform bacilli	Proteus	Penicillin	Streptomycin	Chlortetracycline	Chloramphenicol	Erythromycin	
1	M	76	Coronary thrombosis	+ + +	+	–	–	R	R	R	R	S	Penicillin; streptomycin
2	M	63	Transvesical prostatectomy	+ + +	(+)	(+)	–	R	R	R	S	S	Sulphadimidine; penicillin; streptomycin
3	F	68	Bronchial carcinoma	+ + +	–	–	–	R	R	R	R	S	Chloramphenicol; streptomycin; erythromycin
4	M	83	? Chronic tetanus	+	+	+ + +	–	R	R	R	S	S	Penicillin; streptomycin; chlortetracycline
5	M	65	Bronchial carcinoma	+	–	–	+	R	R	R	S	S	Penicillin; streptomycin; chlortetracycline
6	F	21	General peritonitis	+ +	+ +	–	–	R	R	R	S	S	Penicillin; streptomycin; tetracycline
7	F	63	Bacterial endocarditis	+ + +	–	–	–	R	R	R	S	S	Penicillin; tetracycline
8	M	52	Perforated gastric ulcer	+	–	–	+	Not tested					Penicillin
9	M	28	Carbon monoxide poisoning	+ +	+	–	–	R	R	R	S	S	Penicillin
10	M	66	Agranulocytosis	+ + +	+	–	–	R	R	S	S	S	Penicillin; streptomycin; chlortetracycline; oxytetracycline
11	F	53	Acute leukæmia	+ + +	–	+ + +	–	R	R	R	S	S	Penicillin; streptomycin; chlortetracycline
12	M	67	Coronary thrombosis	+ + +	–	+ + +	+	R	R	S	S	S	Penicillin; streptomycin; chlortetracycline
13	M	54	Mediastinal tumour	+ + +	+	+	–	R	R	S	S	S & R	Penicillin; streptomycin
14	M	52	Head injury	+ + +	(+)	(+)	–	R	R	R	S	S	Sulphadimidine; penicillin; streptomycin

+ + +, heavy growth. + +, moderate growth. +, light growth. (+), < 10 colonies. R, resistant. S, sensitive. S & R, sensitive and resistant strains isolated.

diffusion plate technique in routine use in this laboratory. All strains tested were resistant to penicillin and streptomycin, and all but two to chlortetracycline (aureomycin); conversely, all but two were sensitive to chloramphenicol and all but one to erythromycin. These observations are summarised in the accompanying table, which also records the antibiotics received by each patient while in hospital.

Discussion

Staphylococcal pneumonia in adults usually runs a severe and protracted clinical course accompanied by much destruction of lung tissue (Chickering and Park 1919). A notable exception to this is the fulminating and often fatal staphylococcal bronchopneumonia that occurs in some cases of epidemic influenza. In this type of staphylococcal infection there is little destruction of lung tissue, and death is usually regarded as being due to an overwhelming toxæmia arising from the rapid colonisation of the already infected lungs by inhaled staphylococci.

Although there was no evidence that any of the present fourteen patients with staphylococcal bronchopneumonia had influenza in the first place, the histological appearance of the lung lesions was indistinguishable from that described in patients with influenza dying of a secondary staphylococcal infection of the lungs (Wollenman and Finland 1943).

This similarity between the type of staphylococcal pneumonia occurring as a fatal complication in influenza and that found at necropsy in this otherwise unrelated group of hospital inpatients could most easily be explained if there was a predisposing factor common to them all. A review of the various conditions for which these patients were being treated in hospital, coupled with a consideration of the changes in the lungs in influenza, suggests that the most likely common factor was the existence of pulmonary œdema at the time of the initial infection of the lungs with staphylococci. The presence of a quantity of serous fluid in the alveoli, whether inflammatory or mechanical in origin, would provide, from the outset, favourable conditions for the rapid and widespread colonisation of the lungs by staphylococci and for the subsequent production of toxæmia which are the salient features of this type of pneumonia.

The pattern of resistance to penicillin, streptomycin, and chlortetracycline shown by the strains of *Staph. aureus* isolated from the lungs of these patients leaves little room for doubt that they were all "hospital" staphylococci (see table). The rapidly increasing pollution of the hospital environment with antibiotic-resistant organisms of all kinds (*Lancet* 1956) suggests that this type of staphylococcal pneumonia is likely to become one of the most serious of the cross-infection hazards that the debilitated patient has to face in hospital.

If this is the correct interpretation of the origin and significance of this condition, a careful reassessment should be made of the value and dangers of oral sprays, the passage of tubes through the nasopharynx, and the use of drugs which depress the cough reflex in the immediate postoperative period or in other conditions in which pulmonary œdema is likely to be present.

Early diagnosis is also important because at present the only treatment likely to be successful is the giving of full dosage of the appropriate antibiotic before the number of staphylococci in the lungs has become large enough to produce fatal toxæmia. However, in view of the fact that in only four of the present fourteen cases was any kind of acute infection of the lungs suspected during life, early diagnosis is likely to remain infrequent until the possibility of a staphylococcal bronchopneumonia is regularly considered whenever there is unexpected deterioration in the general condition of a debilitated patient.

Summary

Staphylococcal bronchopneumonia, similar in type to that which occurs as a fatal complication in influenza, has been found in 14 out of 61 hospital patients suspected of bronchopneumonia at necropsy.

In only 4 of these 14 patients had a lung infection been diagnosed during life; none had influenza.

These cases are regarded as hospital cross-infections. Pulmonary œdema may be a predisposing factor.

We wish to thank the consultant staff of the United Cambridge Hospitals for access to their case-records; Dr. A. M. Barrett for his coöperation in the examination of the necropsy material; and Mr. S. T. Haslam, A.I.M.L.T., for his valuable technical assistance.

REFERENCES

Chickering, H. T., Park, J. H. (1919) *J. Amer. med. Ass.* **72**, 617.
Lancet (1956) i, 790.
Wollenman, O. J. jun., Finland, M. (1943) *Amer. J. Path.* **19**, 23.

SODIUM BALANCE STUDIED WITH ^{22}Na AND AN EXTERNAL COUNTER FOR MEASURING WHOLE-BODY RADIOACTIVITY

M. MENCER MARTIN
M.D. Durh., M.R.C.P.

LEVERHULME RESEARCH SCHOLAR, INSTITUTE OF CLINICAL RESEARCH, MIDDLESEX HOSPITAL MEDICAL SCHOOL

GEOFFREY WALKER
B.Sc. Lond., M.B., M.R.C.P.
MEDICAL REGISTRAR

MALCOLM CHAPMAN
B.Sc. Lond., M.B.
HOUSE-PHYSICIAN

MIDDLESEX HOSPITAL, LONDON

IN a previous communication (Martin and Walker 1957) we reported results obtained by measuring, with the long-life isotope ^{22}Na, day-to-day variations in exchangeable body-sodium. The results were compared with those obtained by ordinary sodium-balance studies, and the two methods were found to be in excellent agreement.

We report here results of direct serial measurements of total body-^{22}Na with external counters and compare them with those obtained by the two other methods just mentioned. The body counter used was a modification of that described by Bradley et al. (1957) using four matching Geiger-Müller tubes (20th Century Electronics type G26) partly shielded with lead, mounted on a trolley, and connected in parallel to a probe unit and thence to a conventional scaler. The trolley was low enough to fit under the ordinary hospital bed so that measurements could be made on bed-patients.

Material and Methods

Serial determinations of total body-^{22}Na, specific activity, and total exchangeable body-sodium were made

TABLE I—CLINICAL DATA AND DURATION OF STUDY

Case no.	Age (yr.)	Sex	Diagnosis	Duration of study (days)	Clinical information
1	23	F	Adrenal virilism	20	Adrenal stimulation and suppression tests
2	47	F	Nephrotic œdema	26	Treatment of œdema with ion-exchange resin and mercurial diuretics
3	43	F	Carcinoma of breast with secondary deposits	20	Operation: section of pituitary stalk (Mr. F. L. Davis)
4	63	F	Adrenogenital syndrome	21	Adrenal stimulation and suppression tests
5	46	M	Duodenal ulcer	15	..
6	63	M	Carcinoma of prostate with bone deposits	13	Operation: section of pituitary stalk (Mr. F. L. Davis)

TABLE II—TOTAL BODY RADIOACTIVITY OVER 5 HOURS FOLLOWING ADMINISTRATION OF TRACER DOSE

Time	Counting-rate (per min.)
10.52 A.M.* (dose 25 μC ^{22}Na given)	
10.55 A.M.	10,122
11.00 A.M.	9787
11.07 A.M.	10,218
11.22 A.M.	10,253
11.52 A.M.	10,393
12.52 P.M.	10,497
1.52 P.M.	10,460
2.52 P.M.	10,484
3.52 P.M.	10,374
Mean (after 60 min.) S.D.	10,410 ±83
Coefficient of variation	±0·8%

daily on 6 persons (2 men and 4 women), whose clinical details are summarised in table I.

2 patients were on a measured intake of food and fluids. The intakes of electrolytes and nitrogen were measured by analysis of duplicate diets or, in the case of patients not on a full diet, by analysis of samples of foodstuffs from the same batch as that received by the patients. 1 patient was on the standard hospital low-salt diet containing about 22 m.eq. of sodium daily. The remaining 3 patients were on the ordinary ward diet.

Urine was collected in twenty-four-hour periods starting at 6 A.M. Spot urine samples for determination of radioactivity were collected in a fasting state at the end of each twenty-four-hour-collection period. Fæces were collected over several days, according to the particular study. Samples of blood were taken in the fasting state at about 9 A.M. daily or on alternate days. Patients were weighed at a fixed hour each day on a balance accurate to ±50 g.

The chemical methods used for analysis of diets, fæces, and urine have been described previously (Martin and Walker 1957).

Radiosodium (^{22}Na) was given orally in doses of about 25 μC. The external counter was calibrated for each patient by equating the initial counting-rate, once a constant level had been reached, with the dose given

TABLE III—RESULTS OF VARIATION IN POSITION ON TOTAL BODY COUNTS

Observation no.	Counting-rate (per min.)
1	10,581
2	10,552
3	10,609
4	10,587
5	10,540
6	10,610
7	10,578
8	10,496
9	10,551
10	10,586
11	10,583
12	10,684
13	10,495
14	10,628
15	10,725
Mean	10,587
Coefficient of variation	±0·56%

estimated in a liquid-sample scintillation counter ('Ekco' type N 550). All counts were corrected for counter dead time. Calibration was done in this way in each case because the calibration figure varies from person to person according to the person's size and shape. The radioactivity of spot urine, twenty-four-hour urine, and plasma was measured in a liquid-sample scintillation counter. The radioactivity of each sample was compared with an aliquot of the administered dose, at least 10,000 counts being recorded on each sample. By subtracting the amount of tracer excreted in urine and fæces in each twenty-four-hour period from the amount previously present in the body, the total body-^{22}Na was calculated for each day. At the same time the total body-^{22}Na was measured daily with the external counter. Serial determinations of total exchangeable body-sodium were then obtained independently by measuring specific activity by the dilution principle (Edelman et al. 1952). Since corrections for protein content of plasma and the Gibbs-Donnan effect are opposite in direction they were ignored.

Results

Performance of Whole-body Counter

In the 6 patients, who were of average size and body-build, the dose used gave an initial counting-rate of 10,000–12,000 counts a minute. The background count in the ordinary hospital wards away from artificial radioactive sources was about 700 counts a minute.

During the first hour repeated measurements showed minor fluctuations of ±5%. Thereafter a steady state was reached (table II).

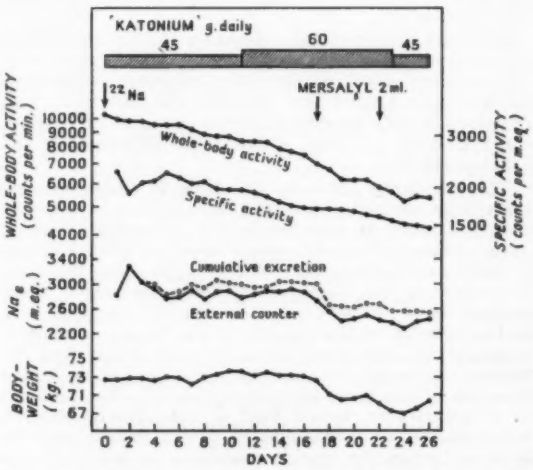


Fig. 1—Case 2 (woman aged 47 with nephrotic œdema): total body counts, specific activities, exchangeable body sodium (by both cumulative-excretion and external-counter techniques), and body-weight.

All measurements of whole-body activity were made in duplicate or triplicate and based on at least 30,000–40,000 counts. As was expected from the total counts recorded, the coefficient of variation was 0·5–0·6%.

To assess the effect of variation in position of patient and counter, duplicate counts were obtained with the counter placed exactly underneath the patient with one set of counters level with his shoulders. The patient was next asked to walk round the bed and lie down again in about the same position as before. No attempt was made to adjust either patient or counter. In 70 such observations the coefficient of variation was 0·7%, giving an overall error of 0·9% for individual measurements of total body-^{22}Na (table III).

Serial Measurements of Na_e

In 5 of the 6 patients the apparent calculated Na_e increased with time over the first 72 hours after ingestion of the dose, and the figure obtained on the third day was accepted as the initial equilibration value. The 6th patient had gross œdema due to the nephrotic syndrome, and equilibrium of distribution was not reached until the fifth day after administration of the tracer dose (fig. 1). In this case specific activity over the first four days was calculated from spot urine samples. Thereafter and in all subsequent cases plasma was used in preference to urine.

From the known standard errors of the individual measurements involved, including flame-photometer

errors and counting errors, the measurement of Na_e was calculated to have a standard error of 2·4%. The accuracy of the Na_e determination based on measurements of total body-^{22}Na with the external counter are well illustrated in fig. 1. The loss of sodium in response to therapy was due to the decrease of œdema fluid accurately reflected in the change in body-weight. The daily Na_e measurements followed the alterations in body-weight so closely that the curves were almost parallel.

Comparison of Isotope Methods

Serial measurements of Na_e by the cumulative-excretion method and by the external-counter technique in the 6 patients are shown and compared in table IV and figs. 1–3. Although the agreement between the two methods is within their confidence limits, the cumulative-excretion method showed a greater gain or smaller loss than did the external-counter method in 5 of the 6 cases studied. This is further reflected in the tracer's calculated biological half-life shown in table V.

Comparison of Isotope and Metabolic-balance Data

The isotope and metabolic-balance data in 2 patients (cases 1 and 3) are compared in table IV and figs. 2 and 3. In both cases the agreement is within the confidence limit of the isotope techniques of ±50 m.eq.

TABLE IV—COMPARISON OF ISOTOPE AND METABOLIC-BALANCE DATA

Case no.	Duration of comparison of balances (days)	Na_e (m.eq.) Initial	Na_e (m.eq.) Final	Change in Na_e (m.eq.)	Metabolic balance change (m.eq.)	Difference (m.eq.)
1	17	1930*	1950*	+ 20*	+57	37*
		1970	2160	+190		133
2	23	3040*	2420*	−620*		120
		3040	2540	−500		
3	17	2020*	1970*	− 50*	−55	5*
		2020	1930	− 90		35
4	18	3050*	3060*	+ 10*		40
		3080	3130	+ 50		
5	11	3250*	3200*	− 50*		10
		3250	3210	− 40		
6	11	2880*	3220*	+340*		220
		2920	3480	+560		
				Unmeasured losses		

* External counter data.

Discussion

The patients formed a heterogeneous group chosen because of anticipated changes in sodium metabolism. Since we were mainly interested in comparing two methods of study under the widest range of conditions, this heterogeneity was an advantage.

The measurement of exchangeable sodium was found to have an error of 2·4%, in keeping with the degree of reproducibility shown by Veall et al. (1955) using eight instead of four Geiger-Müller tubes. These workers, however, suggested that repeated measurements made on the same subject showed a considerably wider variation —in most cases about 5% or more. Such wide variations may be explained by changes in the specific activities of urine used for calculating Na_e, because their paired measurements were made at 11 A.M. and 2 P.M., not in a fasting state, and with the midday meal intervening. The variability suggested by Veall et al. (1955) cannot therefore be accepted as being a true indication of the confidence limit of the method. To exclude errors due to fluctuations in specific activity of urine, specific activity of fasting plasma was used in the present investigation for calculating total exchangeable body-sodium except where otherwise stated.

The slow increase in Na_e over the first three to five days observed on previous occasions (Burch et al. 1952, Miller et al. 1954, Veall et al. 1955, Martin and Walker

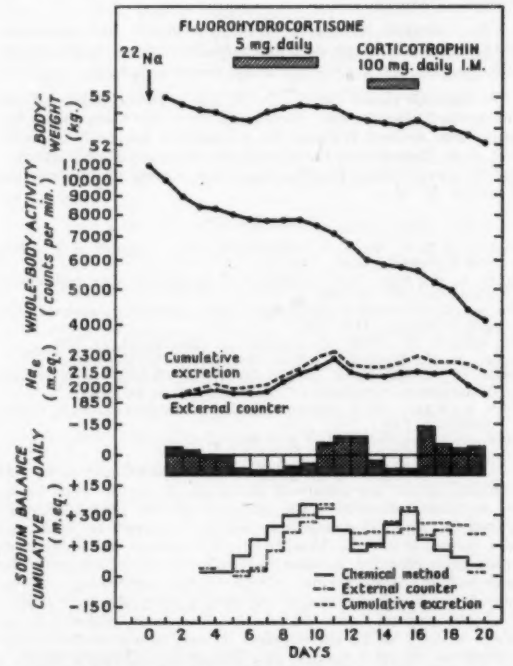


Fig. 2—Case 1 (woman aged 22 with virilism and adrenocortical hyperfunction): comparison of cumulative-excretion, external-counter, and metabolic-balance results.

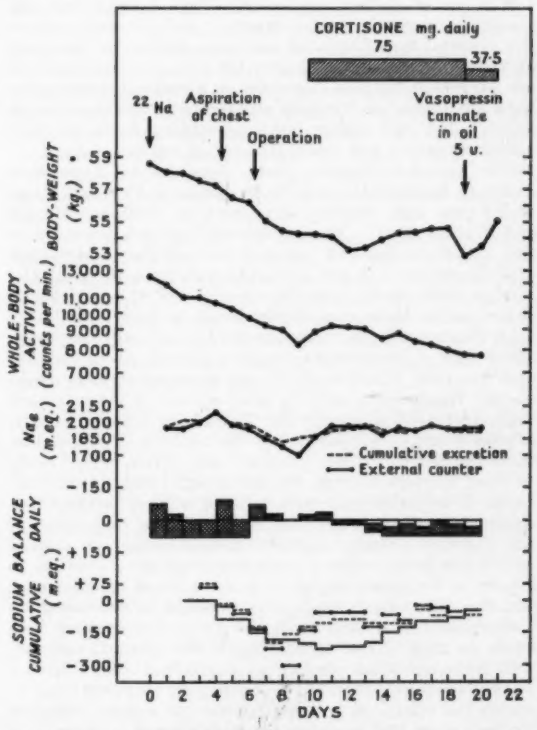


Fig. 3—Case 3 (woman aged 43 with carcinoma of breast treated by section of pituitary stalk): comparison of cumulative-excretion, external-counter, and metabolic-balance results.

TABLE V—BIOLOGICAL HALF-LIFE BASED ON URINARY AND FÆCAL SODIUM LOSS COMPARED WITH THAT OBTAINED DIRECTLY BY EXTERNAL COUNTING

Case no.	Biological half-life (days)		Difference
	Cum. ^{22}Na method	Ext. counter	
1	18	17	1
2	30	28	2
3	25	25	0
4	35	31	4
5	25	20	5
6	34	22	12
	Unmeasured losses		

1957) was confirmed and is consistent with the view that some of the ^{22}Na is associated with a separate and more slowly exchanging compartment of body-sodium, which is believed to be sodium in bone (Miller et al. 1954).

In considering the comparisons between the two isotope methods certain orders of variability must be borne in mind. The accuracy of individual measurements of Na_e is $\pm 2{\cdot}5\%$; hence the differences observed were still within the confidence limits of the two methods. Case 6 must be excluded from the comparison because unmeasured losses rendered the cumulative-excretion data invalid. In 4 of the remaining 5 comparisons the cumulative-excretion balance indicated a greater gain or a smaller loss than did the external-counter method. In the 5th patient (case 3) the counter recorded a smaller loss, but the discrepancy was small. The difference in the two methods is also expressed in the calculated biological half-life, which was in 5 cases out of 6 shorter when estimated directly on total body-^{22}Na. It is tempting to suggest that the differences observed indicate loss of sodium in sweat. This would amount to a daily loss of 1–8 m.eq. of sodium in sweat. Case 1, who lost the greatest amount of sodium in sweat, was allowed to leave the hospital for afternoons and may well have perspired at times in addition to insensible loss. Such figures as are suggested for loss of sodium in sweat are compatible with the finding of Freyberg and Grant (1937) that people lightly clad and doing light laboratory work without visible sweating lost 2·6–9·1 m.eq. of sodium a day.

The metabolic-balance data obtained in 2 patients compare favourably with those obtained by the isotope techniques and confirm our previous findings (Martin and Walker 1957). The reproducibility and accuracy of the metabolic-balance method cannot be ascertained experimentally but are probably less than those of the isotope techniques, probably because of the variability of diet rather than unmeasured losses, although the latter may also contribute. Unmeasured losses will, however, affect the cumulative-excretion method, as in case 6, and are only eliminated by the external-counter technique. Whole-body activity after section of the pituitary stalk decreased in case 3 (fig. 3) and, to a lesser extent, in case 6 out of proportion to the amount of tracer lost from the body. When cortisone was given, whole-body activity increased again, the increment being outside the limits of experimental error. Since neither patient had received further radioactive material, the behaviour of the external counter suggests redistribution of sodium within the body, with a lower counting-rate. Sodium is known to be redistributed in acute adrenal insufficiency, and the observation made may perhaps be explained by a movement of sodium from the extracellular space into bone, an area of low sensitivity of the external counter, with self-absorption playing an additional rôle. Further work is obviously required to investigate this point and to clarify the relationship of distribution of sodium reflected by the tracer and recorded by the external counter.

The results obtained support the view that, with ^{22}Na, the external counter affords a method of unprecedented ease and accuracy for studying sodium metabolism. Neither dietitian, diet kitchen, nor metabolic unit is required; and, once the isotope has equilibrated with the stable sodium available for exchange, results of daily gains or losses can be made known within a matter of minutes to the physician or surgeon in charge of a case. The reproducibility and accuracy of the method can be assessed. Cumulative errors are eliminated by directly measuring the total body content of tracer. In fact the metabolism of sodium can be studied in outpatients because the complete collection of all excreta is unnecessary and the loss of sodium in sweat need not be considered.

The long half-life (2·6 years) of ^{22}Na may give rise to some misgivings about the radiation dose received by the patients, but the biological half-life has been shown to depend on the intake of sodium as well as on the state of the sodium balance (Martin and Walker 1957), and excretion of the isotope can readily be hastened by a high intake of sodium. There is no evidence of permanent retention (Veall et al. 1955). The radiation hazard involved with the doses used is small, being only about half that of the permissible body burden of ^{22}Na.

Summary

The total body-^{22}Na was measured directly with external Geiger-Müller counters; and, by measuring specific activity, exchangeable body-sodium was calculated for each day.

The standard error for whole-body radioactivity was $\pm 0{\cdot}9\%$ and for total exchangeable body-sodium $\pm 2{\cdot}4\%$.

Daily comparisons were made with the cumulative-excretion method in which total body-^{22}Na was calculated by subtracting successive twenty-four-hour losses, and with chemical metabolic-balance data. The methods were found to be in good agreement. Although the differences were small they could be explained by loss of sodium in sweat.

The external counter offers a simple and accurate method for studying sodium metabolism without either collecting excreta or measuring dietary intake.

We wish to thank Dr. J. D. N. Nabarro for much advice and encouragement, and permission to study cases under his care; Dr. Arthur Willcox for permission to study case 5; Prof. J. E. Roberts for facilities in the Barnato Joel Institute; and the Leverhulme Trustees for a scholarship granted to one of us (M. M. M.).

REFERENCES

Bradley, J. E. S., Veall, N., Whiting, F. (1957) *Physics in Medicine and Biology*, **1**, 147.
Burch, G. E., Ray, C. T., Threefoot, S. A. (1952) *Acta med. scand.* suppl. no. 266, p. 329.
Edelman, I. S., Olney, J. M., James, A. H., Brooks, L., Moore, F. D. (1952) *Science*, **115**, 447.
Freyberg, R. H., Grant, R. L. (1937) *J. clin. Invest.* **16**, 729.
Martin, M. M., Walker, G. (1957) *Metabolism* (in the press).
Miller, M., Munro, D. S., Renschler, H. E., Wilson, G. M. (1954) Radioisotope Conference. London; vol. I, p. 138.
Veall, N., Fisher, H. J., Browne, J. C. M., Bradley, J. E. S. (1955) *Lancet*, i, 419.

". . . Contemporary physicists have abandoned some old intuitions about the nature of the physical world. They have, for instance, renounced the concept of the permanence of objects in the submicroscopic realm: a particle does not exist unless it can be localized; if it cannot be located at a particular position, it loses its title as an object and must be described in other terms. Now by an extremely curious coincidence it is found that a very young baby acts with regard to objects rather like a physicist. The baby believes in an object as long as he can localize it, and ceases to believe in it when he can no longer do so. The great difference between the baby and the physicist, of course, is that the baby's faculty of localization is less powerful."—JEAN PIAGET, *Sci. Amer.* March, 1957, p. 46.

COMPARISON OF GASTRIC EMPTYING AND SECRETION IN MEN AND WOMEN WITH REFERENCE TO PREVALENCE OF DUODENAL ULCER IN EACH SEX

MOLLIE BOOTH
M.B. Sydney
RESEARCH FELLOW, DEPARTMENT OF MEDICINE

J. N. HUNT
M.D., D.Sc. Lond.
READER IN PHYSIOLOGY
GUY'S HOSPITAL MEDICAL SCHOOL, LONDON

JILLIAN M. MILES
B.Sc. Lond.
INTERDEPARTMENTAL LABORATORY

F. A. MURRAY
F.R.C.S., M.R.C.O.G.
SENIOR REGISTRAR IN OBSTETRICS AND GYNÆCOLOGY
GUY'S HOSPITAL

ANY difference which there may be between the gastric emptying and secretion of men and of women might be expected to have some bearing on the prevalence of duodenal ulcer in the two sexes. The present paper is intended to supplement by new methods the previous comparisons of gastric activity of men and women in the hope of throwing light on the causes of duodenal ulcer.

Methods

The rate of emptying of a meal from the stomach depends in the main on two variables; the propulsive power of the stomach, and the effectiveness of the inhibitory mechanisms which normally check the emptying of the stomach. The receptors whose activity slows gastric emptying lie mainly in the walls of the duodenum and upper part of the small intestine; hence they are exposed to stimulation by the material leaving the stomach. For example, when the gastric effluent has a high osmotic pressure or when it contains fat, gastric emptying is slowed (Shay 1944). Once it is appreciated that the rate of emptying depends on a balance between the action of the gastric propulsive mechanism and the action of the inhibitory mechanism in the duodenum, comparisons of the gastric emptying of different individuals can be framed in terms of two questions:

(1) How powerful is the gastroduodenal pump when it is not inhibited?
(2) How effective is the inhibitory mechanism?

Thus, for example, rapid gastric emptying might occur either with a very powerful stomach opposed by a normal duodenal brake or with a normally powerful stomach opposed by a very weak brake.

Earlier experiments have shown that saline test-meals containing 100 m.eq. of sodium chloride per litre leave the stomach very quickly, presumably because such meals activate the duodenal brake only to a small extent (Hunt 1956). Thus the emptying-rate of a saline meal gives a tentative index of the uninhibited emptying power of the stomach. On the other hand, a meal of distilled water of equal volume operates the duodenal brake and leaves the stomach at about half the rate of the saline meal. Thus by comparing the emptying-rates of equal volumes of saline and water an index of the activity of the duodenal brake may be obtained.

The test-meals used in this work were mainly designed to investigate gastric emptying but also allowed the assessment of the amounts of acid, chloride, and pepsin secreted in response to the meals.

Technique.—The subjects, who were all volunteers, were students in the medical school or in the school of physiotherapy. They came fasting to the laboratory at about 8 A.M. To standardise the influence of the menstrual cycle on gastric emptying and secretion the women were all tested within the first seven days after the end of their menses (MacDonald 1956). After the stomach has been washed out with 250 ml. of water through a tube the subjects were given a test-meal of 750 ml. of water or of saline solution (100 m.eq. of sodium chloride per litre) at 37°C through the tube. Nine minutes after the saline solution or nineteen minutes after the water meal the gastric contents were recovered through the tube. Any residue was aspirated separately after a further 250 ml. of tap-water had been given. The test-meals contained phenol-red as a marker. From the amount of this material recovered it is possible to calculate the volume of the gastric contents which have left the stomach. From the amounts of the secretion recovered plus those calculated to have left the stomach the total amounts of acid, chloride, and pepsin secreted can be assessed. The methods have been described in full (Hunt 1954).

Results

Gastric Emptying of Saline Meals and Meals of Water

The mean volumes of the gastric contents and of the original meal remaining were much the same in the twenty men and nineteen women both for the saline solution and for the water, as may be seen from the accompanying table, which also shows that the mean volume of saline meal remaining at the end of ten minutes was only slightly greater than the mean volume of the meal of water remaining after twenty minutes. The data for the women were more variable than those for the men.

The same data may be examined in more detail in fig. 1, in which the volumes of the meal remaining after saline solution and after water have been plotted for each person. Since the points fall around a straight line, it follows that those persons who emptied the saline solution rapidly also emptied the water rapidly. Moreover the relationship between the two volumes is the same for the men and the women.

Gastric Secretion in Response to Saline Solution and Water

The table shows that the men secreted about one and a half times as much acid as did the women in response to both saline solution and water. It also shows that, both for the men and the women, the secretion of

MEAN DATA ON GASTRIC EMPTYING AND SECRETION IN MEN AND WOMEN IN RESPONSE TO MEALS OF SALINE SOLUTION AND WATER

	Saline solution (10 min.)		Water (20 min.)	
	Men	Women	Men	Women
Volume of gastric contents (ml.)	454 (±26)	453 (±32)	380 (±23)	398 (±31)
Volume of meal remaining (ml.)	393 (±20)	393 (±30)	327 (±21)	344 (±27)
Output of acid (m.eq.)	2·21 (±0·37)	1·48 (±0·21)	5·22 (±0·70)	3·21 (±0·36)
Output of chloride (m.eq.)			8·58 (±0·72)	6·58 (±0·53)
Output of pepsin (units)	3610 (±440)	2420 (±290)	5850 (±480)	2850 (±290)
Concentration of acid in gastric contents (m.eq. per litre)	3·3 (±0·45)	2·3 (±0·33)	8·2 (±0·75)	5·4 (±0·67)

Figures in parentheses are standard errors of means.

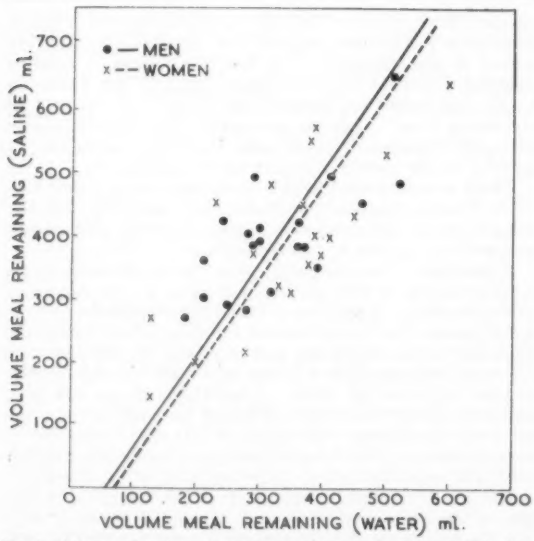


Fig. 1—Volume of test-meal remaining after meals of water (20 min.) and of saline solution (10 min.).

acid was slightly more than twice as great for the twenty-minute test with the water as it was in the ten-minute test with the saline solution. The secretion of chloride in response to water was greater in the men than in the women. The secretion of chloride in response to meals of saline solution cannot be accurately determined by this method, because it is sensitive to errors in assessing the amount of chloride leaving the stomach with the gastric contents. When the concentration of chloride in the meal is 100 m.eq. per litre, these errors dominate the small secretion of chloride which occurs in the ten-minute digestive period allotted to the saline solution.

In response to both meals the men secreted more pepsin than did the women. The men secreted more pepsin in the twenty-minute digestive period with water than they did in the ten-minute period with the saline meal, but this difference does not appear in the data for the women.

Discussion

Gastric Emptying

The present data indicate that test-meals of water and of saline solution leave the stomachs of men and women at much the same rate. The meals are relatively larger for the women than they are for the men because the women are smaller than the men; but this does not seem to have any bearing on these data, for there is no correlation between body-weight and gastric emptying in either the men or the women, although the weights extend over a considerable range in both groups.

Fig. 1 shows that those who empty saline solution quickly also empty water quickly, which fact suggests that intersubject differences of the gastric emptying-rates for water are mainly determined by the gastric propulsive power which has been assessed from the emptying-rate of the saline solution. Had the differences between subjects in the emptying-rates of water been mainly decided by the varying power of the duodenal brake, there would have been little correlation between the emptying-rates of the two meals. From the present findings it can be inferred that the propulsive powers of the stomach and the effectiveness of the duodenal inhibitory mechanisms were equal in the two sexes.

The data for women refer only to the second week of the menstrual cycle, for MacDonald (1956) has shown that there is a sudden small increase in the rate of emptying of test-meals at about the time of ovulation.

The present experiments did not disclose any large differences between the gastric emptying of normal men and women which might explain the greater prevalence of duodenal ulcer in men. Since it has proved impossible to demonstrate any difference between the gastric emptying of normal men and men with duodenal ulcers (Hunt 1957a and b), it may reasonably be assumed that women with duodenal ulcers do not empty test-meals differently from normal women. If a generalisation from these data is permissible, it seems likely that abnormalities of gastric propulsive power and of its regulation by osmotic factors in meals play no part in the pathogenesis of duodenal ulcer.

Gastric Secretion

It is known from the work of Vanzant et al. (1932) that the acidity of the gastric contents after a test-meal is higher in men than in women, a finding which was confirmed in the present investigation. This difference is wholly explained by the higher secretory response of the men. Because there was in these data no correlation between body-weight and the secretion of pepsin, acid, or chloride either in the men or women, the differences between the secretory responses of men and women to a standard meal cannot be attributed to differences in body-weight.

Pathogenesis of Duodenal Ulcers

Although the greater gastric secretion in men might be held to explain the greater prevalence of duodenal ulcer in men, it might also be supposed that duodenal ulceration is the result of a defective resistance on the part of the duodenal mucosa. It is therefore possible that duodenal ulcer is more prevalent in men because men more commonly have a defective duodenal mucosa. If this

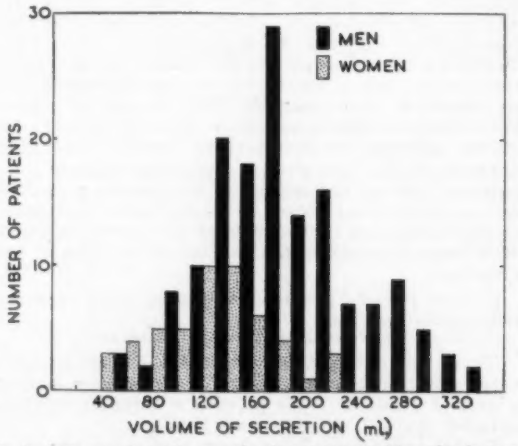


Fig. 2—Volumes of gastric secretion in response to histamine in men and women with duodenal ulcer (Ihre 1947).

were generally true, it would be expected that some men would develop duodenal ulcers at levels of secretion lower than those found in women with duodenal ulcer. This hypothesis can be tested by the published data of Ihre (1947), which have been redrawn in fig. 2. The ordinate shows the frequency in men and women with duodenal ulcer of the particular levels of gastric secretion in response to histamine marked on the abscissa. It is clear that among men and women with duodenal ulcer the lower levels of gastric secretion are equally common. The lower prevalence of duodenal ulcer among women can presumably be explained on the basis that fewer women than men attain to the levels of hypersecretion associated with duodenal ulcer.

Conclusions

If the findings in this study are applicable generally, they may be taken to imply that the difference in prevalence of duodenal ulcer in men and women does not depend on any differences between men and women in gastric emptying, but it may depend on differences between men and women in their gastric secretion of acid and pepsin. No evidence was found that among patients with duodenal ulcer defective tissue resistance is more common in men than women.

Summary

Gastric emptying and secretion were compared in 20 young men and 19 young women.

Test-meals of saline solution were given to assess the gastric emptying power.

Test-meals of water were given to assess the effectiveness of the duodenal osmoreceptors which slow gastric emptying.

No difference was shown between the gastric emptying of the men and the women.

The secretion of acid, chloride, and pepsin was about one and a half times greater in men than in women.

It is tentatively concluded that the different prevalence of duodenal ulcer in men and women does not depend on differences in gastric emptying. It might depend on differences in secretion.

A consideration of Ihre's (1947) data suggests that differences in tissue resistance do not explain the different prevalence of duodenal ulcer in the two sexes.

We are indebted to the volunteers for their coöperation and to the Worshipful Society of Apothecaries for the award to one of us (J. N. H.) of the Gillson scholarship out of which part of the expenses were defrayed.

REFERENCES

Hunt, J. N. (1954) *Guy's Hosp. Rep.* **103**, 161.
— (1956) *J. Physiol.* **132**, 267.
— (1957a) *Lancet*, i, 132.
— (1957b) *Brit. med. J.* i, 681.
Ihre, B. J. E. (1947) *Acta med. scand.* suppl. 196.
MacDonald, I. (1956) *Gastroenterology*, **30**, 602.
Shay, H. (1944) *Bull. N.Y. Acad. Med.* **20**, 264.
Vanzant, F. R., Alvarez, W. C., Eusterman, G. B., Dunn, H. L., Berkson, J. (1932) *Arch. intern. Med.* **49**, 345.

A COMBINED CINERADIOGRAPHIC AND MANOMETRIC STUDY OF THE GASTRO-ŒSOPHAGEAL JUNCTION*

G. S. MULLER BOTHA†
M.B. Cape Town, F.R.C.S., F.R.F.P.S.
LECTURER IN SURGERY, UNIVERSITY OF BIRMINGHAM

R. ASTLEY
M.D. Birm., D.M.R.
CONSULTANT RADIOLOGIST,
THE CHILDREN'S HOSPITAL, BIRMINGHAM

I. J. CARRÉ
M.B. Camb., M.R.C.P., D.C.H.
LECTURER IN CHILD HEALTH, QUEEN'S UNIVERSITY, BELFAST

From the Children's Hospital, Birmingham, and the Departments of Surgery and of Pædiatrics and Child Health, University of Birmingham

THE nature of the closing mechanism between stomach and œsophagus is still a matter of considerable dispute. Numerous methods of study have been used, amongst the latest being cineradiography (Nemours-Auguste 1951) and manometry (Kramer and Ingelfinger 1951, Dornhorst et al. 1954, Fyke et al. 1956). In the study recorded here these methods have been combined.

* A paper read to a meeting of the Society of Thoracic Surgeons, Nov. 2, 1956.

† Present address: Harefield Hospital, Middlesex.

Methods

Investigations were carried out on 20 adult volunteers. One group consisted of 11 normal medical students, average age about 21; 3 were women and 8 men. A second group, aged 24 to 57, consisted of 7 patients (6 men and 1 woman) in whom at laparotomy at least two months previously a metal clip to act as a radio-opaque marker had been firmly attached to the anterior aspect of the œsophageal hiatus of the diagram. Operative examination of the gastro-œsophageal region in all 7 had shown no abnormality; 6 had had partial gastrectomy for peptic ulceration and 1 an appendicectomy. In addition, a man in whom a near-total gastrectomy had been performed and a medical student who subsequently proved to have a hiatus hernia were studied.

Apparatus

Pressures were measured with an electro-manometer of the capacitance type (N.E.P. Ltd.) and a two-channel direct-writing pen recorder (Sanborn 'Twin-viso Cardiette').

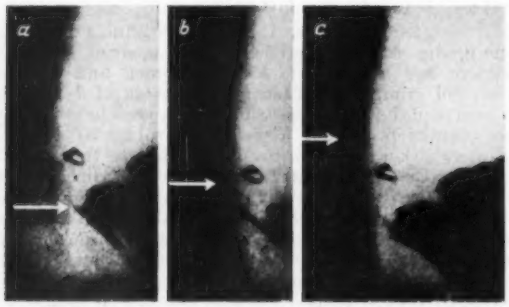
The œsophageal tubes were 'Polythene,' external diameter 2·5 mm. Two types were used. One had at its lower end a small balloon of thin latex, 1 cm. long and 1–1·5 ml. in capacity; there were radio-opaque markers immediately above and below the balloon to indicate its position. The second type was an open tube, with the hole either at the end or on the side and a radio-opaque marker to indicate its situation.

For cineradiography with image intensification and intermittent radiation, the method for cine-angiocardiography (Astley 1955, Astley and Oldham 1956) was used. Each cine frame was exposed as an individual high-speed radiograph, using an exposure of 0·01 to 0·005 sec. Thus movement blurring was eliminated. The precise instant of each picture was indicated below the pressure-tracing on the second channel of the pen recorder. Most examinations were carried out at 16 frames per second, a few at 32.

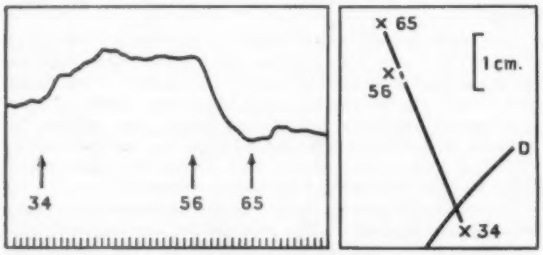
Procedure

Local nasopharyngeal anæsthesia was induced with a few drops of 4% lignocaine, which the subject was instructed not to swallow. A tube was passed through the nose into the stomach and the subject placed in the supine position. If a balloon-ended tube was being used, it was now attached to the manometer and completely emptied and the balloon inflated; the volume of air used was that required to inflate it to atmospheric pressure, as previously determined outside the body. To prevent errors from possible leakage, this procedure was repeated at intervals during the examination. When open tubes were used, they were attached to the manometer, filled with water, and flushed through after every recording.

The subject was turned slightly into the left posterior oblique position to project the lower œsophagus just to the left of the spine and to demonstrate the level of the diaphragm clearly. By fluoroscopy the marker at the end of the tube was adjusted to lie well within the stomach. The subject, fully relaxed, was instructed to breathe quietly, without swallowing. The tube was smoothly withdrawn at a uniform rate until the marker lay a few inches above the diaphragm; on an average, two to four seconds were taken over the withdrawal. During this period simultaneous pressure and cineradiographic recordings were taken, the instant of each frame being indicated on the pressure tracing. The procedure was repeated several times on each subject, keeping well within safe levels of irradiation. Such gastro-œsophageal withdrawal curves were also obtained during inspiration and expiration, and many of the subjects were examined by both the balloon and the water-filled open-tube systems. As a routine, additional pressure tracings without cineradiographs were also obtained, using various



(A) Each cine frame corresponds to a known point on the gastro-œsophageal withdrawal pressure-curve. The upper end of the radio-opaque marker indicates the recording hole (arrows) and shows its position relative to the hiatal clip, the diaphragm, and barium in the fundus.



(B) From each recording a composite tracing is made at a known degree of magnification, to indicate the anatomical position of salient points on the pressure-curve.

Fig. 1—Method of analysis of recordings.

recording speeds and varying rates of withdrawal. At the end of the examination barium was given to localise the gastric fundus, and further combined radiographic and manometric recordings made.

Tracings during which there was inadvertent swallowing were discarded, and at least ten seconds were allowed to elapse after a swallow before recording.

To exclude artefacts due to a closed glottis and the action of the accessory muscles of respiration, tracings made during inspiration were recorded towards the end of the movement and not with the subject holding his breath.

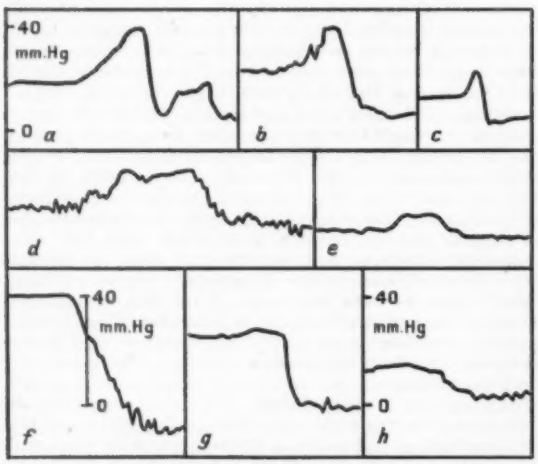
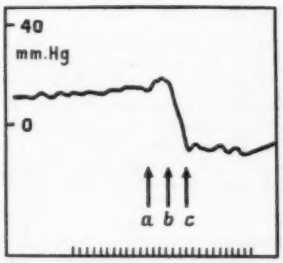


Fig. 2—Types of withdrawal pressure-curve.

a, *b*, *c*: saw-tooth type. *d*, *e*: plateau type. *f*, *g*, *h*: "step" type. *a*, *d*, and *f* were obtained from the same subject.



Analysis

The cine films were projected frame by frame through a prism on to a horizontal surface. As the lengths of the radio-opaque markers in the œsophageal tubes were known, it was possible to correct for varying degrees of radiographic magnification by adjusting the projector distance to obtain an image of true life-size or of a known degree of magnification. In actual practice twice life-size proved convenient.

The indication of the moment of each exposure on the recording meant that each cine-frame corresponded to a given point on the pressure-curve. The films were projected frame by frame and composite tracings were made of each recording to show the site of salient points of the withdrawal curve relative to diaphragm, hiatal clip, and barium in the gastric fundus (fig. 1).

Results

In the 18 normal subjects (i.e., excluding the man with the virtual total gastrectomy and the student who proved to have a hiatus hernia), 227 gastro-œsophageal withdrawal pressure-curves were obtained. 133 were recorded with the open system and 94 with the small balloon. There was combined cineradiographic localisation in 129.

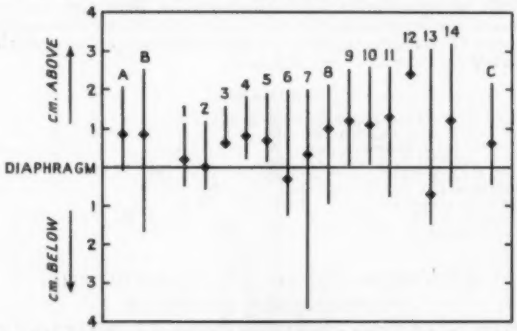


Fig. 3—Average positions of the pressure-changes relative to the diaphragm (represented as in fig. 4).

A is the mean of individual averages of 10 normal subjects examined with an open tube. B is the mean of individual averages of the same 10 subjects examined with the small balloon. 1 to 14 are the individual averages of 14 patients examined with an open tube. C is the mean of 1 to 14.

Types of Curve

The withdrawal curves were of three main types, though these merged one with the other. In a majority (64%) the pressure curve had a "saw-tooth" shape, with a rise preceding the fall to general intrathoracic level (fig. 2, *a*, *b*, and *c*). Another 11% had an initial rise in pressure that assumed a plateau shape (fig. 2, *d* and *e*). In the remaining 25% there was no initial rise and the withdrawal curve formed a step (fig. 2, *f*, *g*, and *h*).

The type of curve depended to a certain extent on the method of recording. With the small balloon a curve containing a pressure rise (either "saw-tooth" or plateau) was always obtained. With an open system, there was a pressure rise in 54% and a step in 46%. Whether the recording hole was at the end or at the side of the tube did not influence results. In a given subject there were often variations in the type of curve for which there was no obvious explanation.

Site of Pressure Changes

In 10 subjects who were examined with both the small balloon and the open tube, a comparison of average results (fig. 3, A and B) shows that the descent to general intrathoracic pressure began at the same point, whichever method of recording was used. However, the gastro-œsophageal pressure changes as recorded with the small balloon took place over a longer segment, with the increase mainly in the phase of rising pressure. This may be attributed to the size of the balloon, and to exclude such errors further description is confined to the results obtained with the open system.

The exact situation of the pressure-changes varied from recording to recording in a given subject (fig. 4).

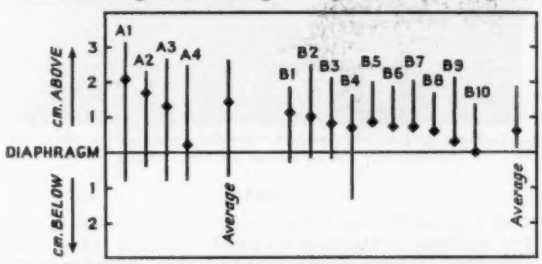


Fig. 4—Situation of the gastro-œsophageal pressure changes in 2 subjects.

The lowest point of each vertical line indicates the site where the pressure-rise begins; the diamond shows the point at which the pressure-descent begins; the upper limit is the site at which general intrathoracic pressure is reached. A 1–4 are four separate open-tube recordings in 1 subject, with their average; B 1–10 are separate recordings and the average in a 2nd subject.

The average results obtained in 14 normal subjects, and the mean of these averages, are shown in fig. 3. In 2 the curves were always of the "step" type. In the remaining 12 there was an initial rise in pressure. This began above the diaphragm in 4 and below it in 8, with a mean position of 0·45 cm. below. In 11 of the 12 subjects the position of the gastro-œsophageal junction was shown by barium; the pressure rise commenced above this level in 6.

The site at which the descent to general intrathoracic pressure began was above the diaphragm in 11 of the 14, with a mean position for the entire group of 0·65 cm. above the diaphragm. *The site at which general intrathoracic pressure was reached was in all cases above the diaphragm, with a mean position of 2·15 cm. above.* The total length of the segment over which these pressure-changes were seen varied from 0·5 to 5·65 cm., with a mean of 2·6 cm.

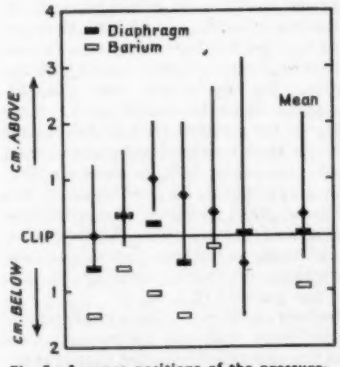


Fig. 5—Average positions of the pressure-changes relative to the hiatus (represented as in fig. 4).

The level of the hiatal clips is taken as the baseline. Individual averages of 6 subjects, examined with an open tube, and their collective mean.

In 6 subjects it was possible to relate the pressure-change as recorded by the open system to the level of the hiatus, which was indicated by a radio-opaque clip (fig. 5). The level of the clip did not necessarily correspond to that of the diaphragm and the difference varied with the phase of respiration; on inspiration the diaphragm descended more than the clip. The average position of the latter was above the diaphragm in 2 subjects and below in 4, although the mean for the group showed a close correspondence of the levels of clip and diaphragm. In 4 of the 6 subjects the site at which the descent to general intrathoracic pressure began was above the hiatus, with a mean position for the group of 0·3 cm. above the clip. (A similar observation was made in a 7th normal subject who was examined only with the small balloon.)

Effect of Respiration

There was no obvious or constant relationship between the type of the withdrawal curve and the phase of respiration. With full inspiration there was an increased difference between the gastric and intrathoracic pressures; but the height of the rising phase (whether measured relative to the gastric pressure or as an absolute value) showed no constant increase. In some recordings it was slightly higher, in others equivocal, and in a few lower.

The length of the segment over which the pressure changes took place tended to be shorter during inspiration, and the point at which the descent to general intrathoracic pressure began tended to be lower in position. But this was not invariably so and the reverse was sometimes seen.

Miscellaneous Observations

In 1 of the normal students the recording tube was slowly pulled up and down for a few centimetres over the gastro-œsophageal junction; in other tracings the tube was left stationary with its hole at this level and the same relative movement obtained by breathing in and out. In this subject the recordings tended to show a three-stage pressure change.

One student, as already mentioned, proved to have a hiatus hernia. The first suspicion of this was the obtaining of bifid tracings of an unusual type during some (but not all) withdrawals. Tube movements caused slight reflux of the barium. Close questioning elicited a suggestive history and a barium swallow confirmed the hernia.

In the subject who had undergone near-total gastrectomy, lack of symptoms and a barium-meal examination indicated normal gastro-œsophageal competence. Normal types of withdrawal curve were obtained, but the point of maximum pressure rise was very low relative to the diaphragm.

Discussion

Two features of the recordings are of particular interest: first, the positive pressure rise above that in the stomach found in 12 of 14 subjects and in over half the curves obtained; secondly, the appreciable length of the segment over which the pressure changes occurred —i.e., 0·5–5·6 cm. (average 2·6 cm.). This second finding is at variance with that of Dornhorst et al. (1954) who concluded from manometric studies that functionally the cardia is a localised region extending over not more than 5 mm. They considered the behaviour of the mechanism at the cardia to be unlike that of known muscle sphincters and favoured the existence of some form of flap or funnel valve.

Our results suggest a mechanism operating in the lower segment of the œsophagus which is producing a compressing effect and therefore unlikely to be purely valvular. The fact that the recorded pressure changes varied in both degree and situation in any one individual indicates that, whatever the mechanism, this too must vary in both its compressing effect and in its exact situation relative to the diaphragm.

There are two possible explanations of the compressing effect—an extrinsic one (i.e., the crural "pinchcock") or an intrinsic sphincteric mechanism. The compression seems unlikely to be related to crural action since the positive deflection was not constantly increased with full inspiration—i.e., when crural action would be expected to be at its maximum. Moreover, in subjects who had a radio-opaque clip indicating the anterior

border of the hiatus, the point at which the fall to intrathoracic pressure began, which was usually also the point of *maximum* pressure, lay above the hiatus in 4 out of 6 subjects. It could be argued that crural action extends above the level of the anterior border of the hiatus, but this seems unlikely since the crura slope upwards and forwards from their spinal origin.

If the extrinsic factor is dismissed as unlikely to account for the pressure changes, it must be concluded that an important intrinsic sphincteric mechanism exists at the lower end of the œsophagus. In the normal subject this may well be the most important component of the gastro-œsophageal closure mechanism, though its existence does not exclude the possibility (indeed, *probability*, especially in the abnormal subject) that other factors play a part.

Summary

Simultaneous cineradiographic recordings and gastro-œsophageal withdrawal pressure-tracings were made in 18 normal subjects. Composite tracings to a known scale showed the site of salient points of the withdrawal pressure-curve relative to the diaphragm, the hiatus (as indicated by a surgical clip), and the gastric fundus.

The form and situation of the pressure-changes varied from person to person and from time to time in a given subject. They were seen over a segment averaging 2·6 cm. in length. In a majority there was a rise to a pressure above that of the stomach preceding the fall to intrathoracic pressure; this rise was not constantly increased during inspiration.

The site at which the descent to intrathoracic pressure began was often above both diaphragm and hiatus (the levels of which were not necessarily identical). The site at which intrathoracic pressure was reached was always above the diaphragm.

It is concluded that in the normal subject an important component of the closing mechanism is a sphincteric action operating at the lower end of the œsophagus.

Grateful thanks are due to the subjects of our study. We are indebted to Prof. F. A. R. Stammers and Prof. J. M. Smellie for their encouragement, and to the endowment research fund of the United Birmingham Hospitals for a grant.

REFERENCES

Astley, R. (1955) *Brit. J. Radiol.* **28**, 221.
— Oldham, J. S. (1956) *Ibid.* **29**, 556.
Dornhorst, A. C., Harrison, K., Pierce, J. W. (1954) *Lancet*, i, 695.
Fyke, F. E., Code, C. F., Schlegel, J. F. (1956) *Gastroenterologia*, **86**, 135.
Kramer, P., Ingelfinger, F. J. (1951) *Gastroenterology*, **19**, 242.
Nemours-Auguste, M. (1951) *Arch. Mal. Appar. Dig.*, suppl., p. 3.

RADIOLOGICAL LOCALISATION OF THE DIAPHRAGMATIC HIATUS

G. S. MULLER BOTHA
M.B. Cape Town, F.R.C.S., F.R.F.P.S.
LECTURER IN SURGERY, UNIVERSITY OF BIRMINGHAM

IT has generally been accepted that the diaphragm, as seen in an anteroposterior radiograph, coincides with the level of the œsophageal hiatus. The study recorded here was carried out to test the accuracy of this radiological concept by marking the hiatus with a metal clip at operation and examining it postoperatively in relation to the diaphragm.

20 suitable volunteer patients of average build were examined (7 women, 13 men). The ages varied from 27 to 63 (average 43). Most of these patients had either a partial gastrectomy or a cholecystectomy. Only those were selected who had benign lesions, who were in a good general condition, and who were found at laparotomy to have normal anatomy around the gastro-œsophageal junction.

Fig. 1—Right oblique, erect posture: the clip lies above the line of the diaphragm but below the phrenic ampulla.

Method

At laparotomy the hiatal area was carefully examined. The left lobe of the liver was mobilised and reflected so that the anterior hiatal margin could be adequately visualised. A metal clip was then firmly and accurately attached to the anterior edge of the diaphragmatic hiatus immediately in front of the œsophagus. Each patient had a radiological examination within two and a half months of the operation. Some patients had several investigations. Radiographs were taken in various postures and during different phases of respiration. When it was necessary to compare these pictures, the same position was ensured as far as possible by overlapping skin markers on each side of the body. The relationship of the clip to the œsophagus was demonstrated by barium swallow and by a 0·8 × 18 cm. balloon containing a radio-opaque contrast medium that was passed down the œsophagus to the gastro-œsophageal junction.

Results

The comparison of radiographs is notoriously difficult, especially when taken in different postures and phases of respiration.

Position of the Clip at Rest

Erect position.—The clip lay at the level of the intervertebral disc of T.11–12 in 75% of patients, and its position varied from the lower border of the 10th thoracic to the upper border of the 1st lumbar vertebra. It was to the left of the midline in every patient, usually at the lateral vertebral border. In the lateral view the clip appeared nearer the spine than the sternum in most patients, but in 2 it lay so far forward that it was nearer the sternum. Its relationship to the diaphragm varied widely. In 62% it was above, in 18% at, and in 20% below the level of the diaphragm. In 3 patients it was well above the diaphragm (half or more of a vertebral body), and in 2 it was well below. The clip could be located above the diaphragm in oblique views, but here there was great variation, depending mainly on the degree of obliquity of the patient (fig. 1).

Supine and Trendelenburg positions.—The most interesting feature in most subjects was the disproportionate cephalad movement of the clip relative to the diaphragm; the diaphragm ascended higher than the clip. This was slightly more accentuated in the Trendelenburg position. In some patients the relative positions of clip and diaphragm remained unchanged (figs. 2 and 3), but an upward movement was present in every patient, usually of from half to one vertebral body. The greatest move-

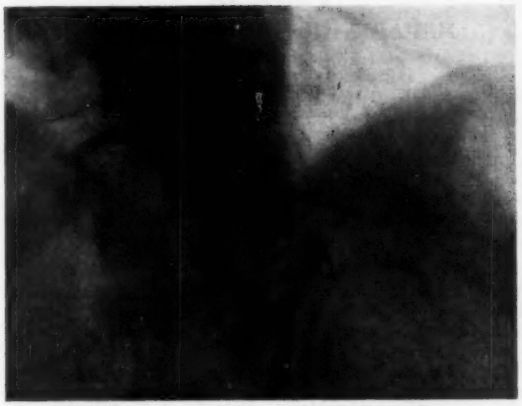


Fig. 2—Supine: the clip lies below the diaphragm.

Fig. 3—Supine: clip above the diaphragm.

ment noticed was of two vertebral bodies (from erect, in expiration, to Trendelenburg, in expiration). A much bigger change in position took place on moving from the erect to the supine position than from the supine to the Trendelenburg. Not only did the clip move cephalad, but it tended to move to the left in most patients. In some, this shift to the left was absent. The clip was usually further from the vertebral column in the supine and Trendelenburg positions. The marker became a midline structure in the right lateral position and drew away laterally from the vertebral column in the left lateral position.

Position of Clip during Respiration

In most patients, the excursion of the clip was about one vertebral body during the respiratory cycle with the patient in the same position; but movement of two vertebral bodies was not uncommon. Though the clip moved up and down with the diaphragm, its excursion was less. During inspiration, the descent of the diaphragm was relatively greater, and in most patients the clip was well above at the end of inspiration. During expiration the diaphragm ascended more than the clip did, so that in most patients it was at or below the diaphragm. The greatest excursion was observed in the supine position in a woman in whom the clip moved almost two and a half vertebral bodies.

During inspiration the clip moved medially as well as downwards. The extent of medial movement varied from patient to patient. In a few, no medial movement at all was noticed. During expiration the clip moved upwards and slightly to the left in most patients. Together with the downward and medial movement on inspiration, the clip also moved posteriorly in most cases. This posterior movement was very slight and could sometimes only be seen when the lower œsophagus was displayed by means of the long balloon (fig. 4). In a few patients it was absent, and in one the clip actually moved forwards during inspiration. Movement posteriorly during inspiration was much less than anterior movement during expiration.

Screening.—The radiographs were superior for accurate localisation, but screening was by far the most valuable method of demonstrating the disproportionate movement of clip and diaphragm.

Discussion

In the first few patients examined, the discovery that the level of the clip was often above that of the diaphragm raised initial doubt (subsequently refuted) about the accuracy of placement of the clip on the hiatal margin. Therefore, in the succeeding operations, even greater care was taken to ensure precise anatomical fixation; moreover, correct positioning was confirmed in all the subjects by anteroposterior and lateral radiographs with the œsophagus demonstrated by barium or by the long opaque balloon.

Thus there can be little doubt that, in most people at least, the anterior margin of the hiatus is situated above the line that indicates the diaphragm radiographically. In only a minority is it at or below this level. This conclusion, which has been emphasised in a combined cineradiographic and manometric study of the gastro-œsophageal junction by Botha et al. (1957), agrees with the findings of Monges et al. (1955), who applied clips to the anterior hiatal margin and to both crura; post-operatively, X-ray examination showed that all three clips appeared above the diaphragm in that patient.

Fig. 4—Left lateral, erect; deep inspiration: posterior movement was so slight that the balloon appears almost straight.

The relationship between the levels of the diaphragm and hiatus varies not only from person to person but also with posture and the phase of respiration. During inspiration the hiatus moves downwards, inwards, and slightly backwards; Jouve-Fournier (1955) made the same observation with a radio-opaque balloon in the lower œsophagus.

The fact that the levels of the hiatus and the diaphragm do not necessarily correspond is significant for two important reasons. First, it means that various conclusions about the nature of the gastro-œsophageal closing mechanism have to be reconsidered—e.g., the manometric studies of Dornhorst et al. (1954) and the

fluoroscopic observations of Poppel et al. (1956); and secondly, it is important in the assessment of disease in this region, and it must be particularly remembered in the consideration of neoplasms, achalasia, diverticula, or hiatal herniæ.

Poppel et al. (1956) examined 500 subjects and saw "that the esophagus was indeed pinched off when the diaphragm descended in forced inspiration; however, this pinching-off did not occur at the level of the diaphragm but 0·5 to 3 cm. above it. It was in reality the constriction of the inferior esophageal sphincter that occurred synchronously with the descent of the diaphragm. It was this action that was previously misinterpreted as a pinchcock action of the diaphragm." It is now clear that their inquiry did not reveal whether the constriction was due to hiatal action or to closure of the inferior œsophageal sphincter. It is, furthermore, difficult to understand why the œsophageal sphincter should contract synchronously with the diaphragm.

In considering the pinchcock action of the right crus, it is fundamental to appreciate that the crura act synchronously with the diaphragm, not independently of it. Interesting diagrams in the past have convincingly demonstrated that the œsophago-gastric angle became more acute in inspiration. The occluding effect of the mechanical valve at the cardia was thus accentuated, and gastro-œsophageal competence increased. The present investigation, however, conclusively showed the opposite. Disproportionate descent of the diaphragm and clip during inspiration opened the angle, which suggests that this factor is not so important in the closing mechanism as is commonly thought. The wide variation in position and behaviour of the hiatus suggests that crural function may not be the same in every patient. Too dogmatic views on crural action should therefore be regarded with suspicion.

Palmer (1953) established the position of the "cardia" relative to the diaphragm after silver clips were attached to the mucosal junction at œsophagoscopy. The same method was used to ascertain the degree of gastric herniation (Allison 1951, Palmer 1954). But if the hiatus is not at diaphragmatic level no conclusions can be drawn from minor upward or downward shifts of mucosal clips.

Summary

The relative positions of the diaphragm and a radio-opaque marker on the œsophageal hiatus were studied in 20 patients.

The position of the clip did not necessarily correspond to diaphragmatic level and there was considerable variation from patient to patient, in its position as well as in its movements. The clinical, radiological, and experimental significance of these observations is outlined.

I am indebted to Prof. F. A. R. Stammers, department of surgery, University of Birmingham, and the endowment research fund. My thanks are due to Dr. Roy Astley, radiologist to the Children's Hospital, for valuable suggestions, and to Mr. T. F. Dee, photographer to the Queen Elizabeth Hospital, for the illustrations.

REFERENCES

Allison, P. R. (1951) *Surg. Gynec. Obstet.* **92**, 419.
Botha, G. S. M., Astley, R., Carré, I. J. (1957) *Lancet*, i, 659.
Dornhorst, A. C., Harrison, K., Pierce, J. W. (1954) *Ibid*, i, 695.
Jouve-Fournier, P. (1955) Contribution à l'Etude Anatomo-Physiologique et au Repérage Radiologique de l'Hiatus Œsophagien. Marseilles.
Monges, H., Monges, A., Gambarelli, J., Jouve-Fournier, P. (1955) *Arch. Mal. Appar. dig.* **44**, 1033.
Palmer, E. D. (1953) *Radiology*, **60**, 825.
— (1954) *J. thorac. Surg.* **27**, 271.
Poppel, M. H., Lentino, W., Zaino, C., Jacobson, H. (1956) *J. Amer. med. Ass.* **161**, 196.

A NOTE ON
HEPARIN CLEARING IN VIVO

V. FELT
M.D. Prague
RESEARCH FELLOW

D. REICHL
D. Chem. Prague
RESEARCH FELLOW

INSTITUTE FOR CARDIOVASCULAR RESEARCH, PRAGUE, CZECHOSLOVAKIA

THE rôle of heparin in lipid metabolism has attracted the interest of many workers. Since Hahn (1943) reported that intravenous heparin cleared the initial turbidity of plasma of dogs in alimentary lipæmia within a minute after injection.

Kubie et al. (1956a) have shown that intravenous heparin considerably depressed the polarographic protein double wave of human serum in alimentary lipæmia. This depression has been attributed by Kubie et al. (1956b), Marha (1955), and Reichl (1955) to the liberation of non-esterified fatty acids observed under such conditions by Grossman et al. (1955).

Kubie et al. (1956b) have also shown that, when precautions were taken to minimise in-vitro chemical changes in serum after the injection of heparin, the

RESULTS

Subject no.	Age (yr.)	Concentration of E600 in blood (*M*)	Turbidity of serum without added E600	Turbidity of serum with added E600	Sample *
1	30	$2 \cdot 10^{-4}$	70	65	1
			300	310	2
			215	305	3
			210	310	4
2	21	,,	65	70	1
			253	250	2
			65	245	3
			70	200	4
3	40	,,	75	70	1
			400	400	2
			120	430	3
			90	390	4
4	41	,,	125	110	1
			860	860	2
			590	900	3
			520	900	4
5	41	,,	120	110	1
			720	700	2
			320	695	3
			290	670	4
6	24	,,	45	50	1
			240	245	2
			55	240	3
			60	200	4
7	33	,,	80	80	1
			910	915	2
			420	915	3
			180	710	4
8	45	$6 \cdot 10^{-4}$	40	50	1
			298	290	2
			62	250	3
			45	220	4
9	22	,,	62	65	1
			260	262	2
			60	236	3
			55	230	4
10	25	$1 \cdot 10^{-4}$	36	..	1
			185	192	2
			70	125	3
			60	110	4
11	22	,,	65	55	1
			386	401	2
			35	312	3
			40	300	4
12	27	,,	32	36	1
			412	420	2
			..	320	3
			35	105	4
13	30	,,	25	38	1
			75	90	2
			35	30	3
			20	30	4

* 1, blood taken in fasting state.
2, blood taken 3 hr. after ingestion of 300 ml. of cream.
3, blood taken 5 min. after intravenous injection of 25 mg. of heparin.
4, blood taken 15 min. after intravenous injection of 25 mg. of heparin.

depression of the polarographic protein double wave was either small or absent. It was therefore of interest to know whether the changes in optical properties of the serum were merely an in-vitro effect or also the result of physiological processes in the circulation.

It is known that the catalytic effects of lipoproteinase, which is activated by heparin, can be prevented by the use of suitable inhibitors in vitro. Therefore we examined the effect of intravenous heparin on the turbidity of serum obtained from blood to which an inhibitor of lipoproteinase had been added immediately after withdrawal of the blood to exclude any possible in-vitro effects.

Material and Method

We examined sera from 8 healthy women and 5 healthy men. In each case a sample of blood was taken while the person was fasting. Each person next ate a fat meal consisting of 300 ml. of rich cream. Three hours later a sample of venous blood was taken, and with the same needle 12·5 mg. of heparin in 5% solution was injected. Exactly 5 minutes and 15 minutes after heparinisation further samples of blood were collected. Immediately after collection 5·0 ml. of blood was mixed with 0·5 ml. of a solution of diethyl-*p*-nitrophenyl-phosphate (' E600 '), a potent inhibitor of lipoproteinase. The final concentration of inhibitor in the samples of blood was $1 \cdot 10^{-4}$–$2 \cdot 10^{-3}$ *M*. As a control a further aliquot of the same sample of blood was mixed with saline solution in similar proportions. The blood was allowed to clot at 37°C, and serum was separated by centrifugation at 3000 r.p.m. The turbidity of the sera obtained was measured with the ' Unicam ' photo-electric colorimeter with the red filter.

Results

The addition of E600 to cleared serum in similar proportions had no effect on its turbidity under the same conditions.

The results presented in the accompanying table show that, at sufficiently high final concentrations of E600 ($2 \cdot 10^{-3}$ *M*) there was practically no optical change within 5 minutes after heparinisation. In subjects 3 and 4 there was even a slight increase in turbidity 15 minutes after heparinisation there was slight clearing; but in subjects 1 and 4 the turbidity was still unchanged. Decreasing the concentration of E600 increased the extent of clearing. The concentrations used in such instances ($1 \cdot 10^{-4}$ *M* and $6 \cdot 10^{-4}$ *M*) were evidently too small to inhibit clearing entirely. All the control samples without added inhibitor showed the well-known dramatic decrease in turbidity (clearing) within 5–15 minutes after heparinisation. The in-vitro clearing was relatively smaller in cases 1 and 4 who did not show any decrease in turbidity in the presence of E600 even 15 minutes after heparinisation.

Preliminary experiments with plasma maintained at 0°C without added inhibitor did not show total inhibition of in-vitro clearing.

Discussion

The large differences in turbidity of sera with and without inhibitor emphasise the rôle of in-vitro processes caused by heparinisation. Probably the sera obtained from blood treated with inhibitor have a turbidity approaching that existing in the circulation under physiological conditions. This turbidity would be the net result of formation and disappearance of chylomicra from the circulation under given conditions. This may explain the changes in turbidity observed at various intervals after heparinisation. It may therefore be assumed that, 5 minutes after heparinisation (under the experimental conditions stated), the rate of formation of chylomicra exceeded the rate of their disappearance; only after 15 minutes after heparinisation did the rate of disappearance of chylomicra exceed their rate of formation (except in cases 1 and 4).

The enhancement of lipolysis by intravenous heparin may be the cause of an accelerated removal of fatty acids from the blood-vessels into the tissues. The evidence presented here shows that an increased lipolytic activity causes in-vitro turbidity changes which have frequently been considered to represent in-vivo changes. The use of a suitable inhibitor shows that, in alimentary lipæmia in man, 5 minutes after the intravenous injection of 12·5 mg. of heparin there is practically no change in turbidity.

We are indebted to Dr. G. Kubie for his interest and advice in the preparation of this manuscript.

REFERENCES

Grossman, M. I., Moeller, H. C., Palm, L. (1955) *Proc. Soc. exp. Biol., N.Y.* **90**, 106.
Hahn, P. F. (1943) *Science*, **98**, 19.
Kubie, G., Felt, V., Reichl, D. (1956a) *Nature, Lond.* **178**, 210.
— Reichl, D., Felt, V. (1956b) *Proc. int. Conf. biochem. Problems of Lipids* (in the press).
Marha, K. (1955) *Chem. Listy*, **49**, 1896.
Reichl, D. (1955) *Ibid*, **49**, 1886.

ADDISONIAN CRISIS DUE TO PELLAGRA

F. D. ROSENTHAL
M.D. Lond., M.R.C.P.
SENIOR MEDICAL REGISTRAR

F. LEES
M.B. Sheff., M.R.C.P., D.C.H.
MEDICAL REGISTRAR

THE ROYAL INFIRMARY, SHEFFIELD

COLLAPSE and sudden death in patients suffering from pellagra is mentioned in textbook descriptions of the disease (Cecil and Loeb 1955). The possibility of a relationship between adrenocortical function and pellagra was first considered by Finotti and Tedeschi (1902) and has recently been reviewed by Mainzer (1950). Because syncope and collapse in pellagra are usually sudden, it must rarely be possible to carry out biochemical studies in patients who collapse. We have found no reports of such studies which would clearly be valuable in deciding whether addisonian crisis and acute collapse in pellagra are accompanied by similar derangements of electrolyte metabolism. For this reason we present details of a patient with pellagra in whom electrolyte and steroid estimations were made during an acute phase of her illness resembling addisonian crisis.

Case-report

A widowed housewife aged 60 was admitted to hospital on June 10, 1955. Her appetite had always been poor, and for about a year she had lived on a monotonous diet consisting each day of 2 pints (1200 ml.) of milk, some semolina, and six slices of a proprietary brown bread with small amounts of butter. Occasionally she took very small portions of chicken. During this time she lost 2 stone (12·5 kg.) in weight. In March, 1955, she had an attack of diarrhœa lasting a week, when she passed three watery yellow stools a day. Subsequently her skin became dark on the exposed surfaces. Early in May, 1955, she again started to have diarrhœa and occasionally vomited small amounts of bile-stained fluid; these symptoms persisted till her admission. On May 28, 1955, she sat in the bright sunlight for six hours, and as a result the surfaces exposed became more severely pigmented.

She was thin and mentally dull. The whole skin showed brown pigmentation which was particularly evident on the exposed surfaces. She had hyperkeratotic areas on the backs of her hands and feet and some brown pigmentation of her tongue. Pigment was not concentrated in the skin creases. The fæces were bright yellow and loose. The blood-pressure was 100/30 mm. Hg and her weight 6 stone 3 lb. (40 kg.).

She was seen by Dr. I. B. Sneddon, who confirmed that the skin appearances were those of severe pellagra.

Investigations.—A radiograph of the chest was normal. The hæmoglobin was 13 g. per 100 ml. The fæces contained no occult blood, and the fractional test meal showed a histamine-fast achlorhydria. The urine and electrocardiogram were normal. The Wassermann reaction was negative. The serum-

sodium was 137, serum-potassium 4·6, serum-chloride 97, and plasma alkali reserve 26 m.eq. per litre, and blood-urea 26 mg. per 100 ml.

Progress.—On the morning of June 16, 1955, six days after admission, she felt very lethargic and weak after fasting overnight for a barium meal. She appeared to be shocked and very ill; her blood-pressure had fallen to 60/0. The blood-sugar was 115 mg. per 100 ml., but the serum-sodium had fallen to 130 m.eq. per litre and the serum-potassium had risen to 7·4 m.eq. The serum-chloride was 92 m.eq., but the plasma alkali reserve was only 10 m.eq. The blood-urea had increased to 83 mg. per 100 ml.

Treatment and Response.—She was given nicotinamide 500 mg. and two ampoules of vitamin-B complex (' Becosym ') intramuscularly, and sodium lactate (1/6 molar solution) 3 litres intravenously in the next twenty-four hours. In addition she received cortisone acetate 25 mg. orally six-hourly for four doses. By 4.30 p.m. on the same day she had improved and her blood-pressure had risen to 110/80. The serum-sodium was 126, serum-potassium 6·6, serum-chloride 98, and plasma alkali-reserve 10 m.eq. per litre, and blood-urea 36 mg. per 100 ml.

Next day her blood-pressure was 130/80, serum-sodium 127, serum-potassium 4·3, serum-chloride 89, and plasma alkali-reserve 24 m.eq. per litre., and blood-urea 25 mg. per 100 ml.

Treatment was continued with cortisone acetate (12·5 mg. by mouth twice daily) for a further seven days and one ampoule of vitamin-B complex once daily intramuscularly for twenty-eight days. During this time she improved further, she became more alert, her appetite returned, the diarrhœa ceased, and the stools became normal. The pigmentation of the skin and tongue gradually faded with desquamation of the hyperkeratotic areas. The blood-pressure was maintained at 100/70.

Investigations after Completion of Treatment.—Serum-sodium 140, serum-potassium 4·0, serum-chloride 103, plasma alkali-reserve 25 m.eq. per litre, and blood-urea 23 mg. per 100 ml. The liver-function tests and a liver biopsy were normal. A glucose-tolerance test and a barium-meal examination with follow-through showed no abnormality. A plain radiograph of the abdomen showed no adrenal calcification.

Follow-up.—She was discharged on Aug. 4, 1955, and has been followed since this time. She required no specific therapy and maintained herself on a normal diet. In November, 1956, she had gained more than 2 stone (12·5 kg.) and weighed 8 stone $6^1/_2$ lb. (53·6 kg.). The pigmentation had almost completely disappeared. The serum-sodium was 144, serum-potassium 4·9, serum-chloride 103, and plasma alkali-reserve 21 m.eq. per litre, and blood-urea 21 mg. per 100 ml. A urinary chromatogram, kindly performed by Mr. D. C. Cusworth in Prof. C. E. Dent's laboratory at University College Hospital, London, was unlike that seen in the pellagra-like syndrome with amino-aciduria described by Baron et al. (1956).

Urinary Steroid Excretion.—On admission five days before the crisis, the twenty-four hour excretion of 17-ketosteroids was 26·6 mg. and of 17-ketogenic steroids 25·6 mg.—values slightly higher than those normally obtained in this hospital's laboratory. On July 8, 1955, twenty-two days after the crisis and fourteen days after stopping cortisone, the 17-ketosteroid excretion was 5·0 mg. and the 17-ketogenic steroid excretion 7·1 mg. in twenty-four hours. Next day the values were 3·5 mg. and 7·4 mg. respectively. On July 19, 1955, she was given corticotrophin 25 mg. intramuscularly six-hourly for four doses. The twenty-four hour excretion of 17-ketosteroids was 11·0 mg. and of 17-ketogenic steroids 26·0 mg. This is a normal response. On Nov. 26, 1956, the 17-ketosteroid excretion was 3·1 mg. and the 17-ketogenic steroid excretion 6·7 mg.

Discussion

Pigmentation of the skin and mouth are presenting features in pellagra and in Addison's disease; and asthenia, loss of weight, and hypotension are common in both diseases. Mental changes, diarrhœa, dermatitis, and light sensitivity help to differentiate pellagra from Addison's disease, but the fact that so many features are common to both diseases has given rise to speculation that hypocorticism may be a feature of pellagra.

Necropsy studies of the adrenal glands in cases of pellagra have shown partial or even almost complete atrophy of the zona glomerulosa as the outstanding abnormality (Aschoff 1933, Froboese 1934, Herzenberg 1935, Eger 1937, Hellwig and Forman 1942). Variable loss of lipoid (Aschoff 1933, Froboese 1934, Herzenberg 1935, Eger 1937) and sclerosis of the capsule (Froboese 1934) have also been reported, but it is striking that the zona fasciculata and zona reticularis have remained virtually unaffected. A few biochemical observations have been based on indirect tests of adrenocortical function. Mainzer (1949) found increased insulin sensitivity in pellagra and concluded that this afforded evidence of hypocorticism. Miowski and Tadzer (1954), using Thorn's test no. 1, concluded that there was some disturbance of the diencephalic-adrenal axis. There was only a small fall in circulating eosinophils after giving adrenaline and this was partially corrected by corticotrophin therapy.

There is little doubt that our patient had pellagra with typical skin lesions and gastro-intestinal disturbances which resolved with nicotinic acid and vitamin-B complex. There was a gain of more than 2 stone in weight in the year after her illness. The symptoms did not recur, though she had no specific therapy after the acute phase of her illness. The urinary chromatogram excluded the pellagra-like disease with amino-aciduria as described by Baron et al.

Before the acute episode, the urinary steroid excretion was slightly higher than normal and suggested an adrenocortical stress response. During the crisis the normal blood-sugar level appeared to be an indication of adequate glucocorticoid activity. During and after recovery the urinary steroid excretion and the corticotrophin stimulation test were also normal. On the other hand, the sudden onset of hypotension, uræmia, and high serum-potassium at a time when no appreciable diarrhœa or vomiting took place suggested a failure of mineralocorticoid secretion. Such findings are identical with those found in addisonian crisis.

The results in our patient therefore suggest selective damage to the zona glomerulosa which is considered to be the main secretor organ of mineralocorticoids (Landing 1955). The fact that improvement was maintained for more than a year indicated that the lesion was reversible. The reported necropsy findings of selective damage to the zona glomerulosa seem to provide a pathological basis for these biochemical changes.

Our patient was treated with cortisone for acute adrenocortical insufficiency, but there is no evidence that recovery might not have resulted from treatment with nicotinamide and vitamin-B complex alone.

Summary

The clinical and biochemical features of a crisis in a woman with pellagra suggest an acute failure of mineralocorticoid metabolism. Reports of selective damage of the zona glomerulosa of the adrenal cortex in pellagra provide a possible pathological basis for this failure.

We wish to thank Dr. H. P. Brody under whose care this patient was admitted for his help and encouragement. Our thanks are also due to Mr. M. J. Lavell for the steroid estimations and to Dr. D. S. Munro for correcting the manuscript.

REFERENCES

Aschoff, L. (1933) *Münch med. Wschr.* **80**, 296.
Baron, D. N., Dent, C. E., Harris, H., Hart, E. W., Jepson, J. B. (1956) *Lancet*, ii, 421.
Cecil, R. L., Loeb, R. F. (1955) A Textbook of Medicine. London; p. 603.
Eger, W. (1937) *Virchows Arch.* **299**, 643.
Finotti, R., Tedeschi, E. (1902) *Rif. med.* **2**, 230.
Froboese, C. (1934) *Verh. disch. path. Ges.* **27**, 194.
Hellwig, C. A., Forman, L. H. (1942) *Amer. J. clin. Path.* **12**, 210.
Herzenberg, H. (1935) *Beitr. path. Anat.* **96**, 97.
Landing, B. H. (1955) *Ciba Colloquia Endocrinol.* **8**, 52.
Mainzer, F. (1949) *Trans. R. Soc. trop. Med. Hyg.* **43**, 329.
— (1950) *Klin. Wschr.* **28**, 729.
Miowski, D. K., Tadzer, I. S. (1954) *Ann. Derm. Syph., Paris*, **81**, 259.

TALC GRANULOMA OF THE UMBILICUS

R. D. G. CREERY
M.D. Belf., M.R.C.P., D.C.H.
PÆDIATRICIAN,

D. M. MCCLURE
M.B. Glasg.
PATHOLOGIST

R. J. RUTHERFORD
M.S. Durh., F.R.C.S.
SURGEON

GENERAL HOSPITAL, SOUTH SHIELDS

GRANULOMA of the umbilicus in young infants is not uncommon; but, whereas the part played by talc in the pathogenesis of granulomatous lesions within the abdomen and elsewhere has been clearly established (McCormick and Ramsey 1941, Roberts 1947), we have been unable to find any published report of a similar relationship in umbilical lesions.

In the past few months we have seen five cases in which such an association seemed to exist, as in the following one:

The infant was a healthy male delivered normally at term. The cord had separated at the seventh day, but the umbilicus did not heal, and a purulent discharge was present from the tenth day. "Something red in the navel" was seen at one month, and the discharge had continued unabated. Initially, sterile cord powder (conspers. alum. et zinc. oxid. pro infant. *B.P.C. 1954*) had been applied to the umbilicus, but subsequently a standard proprietary talcum baby-powder was used.

On examination at six weeks the umbilicus contained a pink granulomatous mass of tissue, from which a purulent discharge exuded. Ten days later this was excised under general anæsthesia. Healing was satisfactory, and at three months the umbilicus was dry and the granuloma had not recurred.

Histology

On microscopy these specimens present a gradation of features on a common background of heavy non-specific infection, which is related to the extent to which the talc crystals become incorporated into the granulation tissue. In some areas these may be wholly confined to the superficial inflammatory exudate; but, where the doubly refractile particles are situated more deeply, various degrees of giant-cell formation are found. In the actively inflamed areas this is generally slight or absent; but, where connective tissue has become organised, the talc crystals are seen in distinct aggregates, with conspicuous multinucleated giant cells. These, however, are of typical foreign-body pattern, and in no instance have we found any indication of endotheloid-cell elements of follicular structure.

Discussion

In a review of disorders of the infant umbilicus Isbister (1953) considers that the umbilical granuloma, as distinct from the umbilical polyp of intestinal tissue, is usually secondary to infection. The finding of doubly refractile crystals in these granulomata must pose the question as to how often such lesions are sustained by the free use of talcum powder with which most infants are dusted from birth, particularly in view of the fact that, though such lesions are not uncommon, surgical biopsy is hardly ever resorted to.

In these cases the course of events differs from that associated with talc granuloma of the peritoneum and fallopian tubes because, in the early stages, the formation of granulation tissue has not been initiated by the talc crystals, the umbilical stump healing normally by this process. There is little evidence at first of any active tissue response to their presence, as shown by the lack of foreign-body reaction, from which it seems that the crystals delay the healing largely by creating conditions favourable to the persistence of infection, and only at a later stage, when acute inflammation has subsided, does giant-cell reaction clearly develop. Possibly, after a further lapse of time, a pseudotuberculous picture might develop corresponding to those described after the traumatic introduction of silicious particles into the subcutaneous tissues (Shattock 1916, Faulds 1935) and in surgical scars (Feinberg 1937); but there are no grounds for suggesting that any long-term detrimental effects may develop in such cases.

It seems, however, reasonable to suggest that such potentially irritant powders should not be used, at least before the

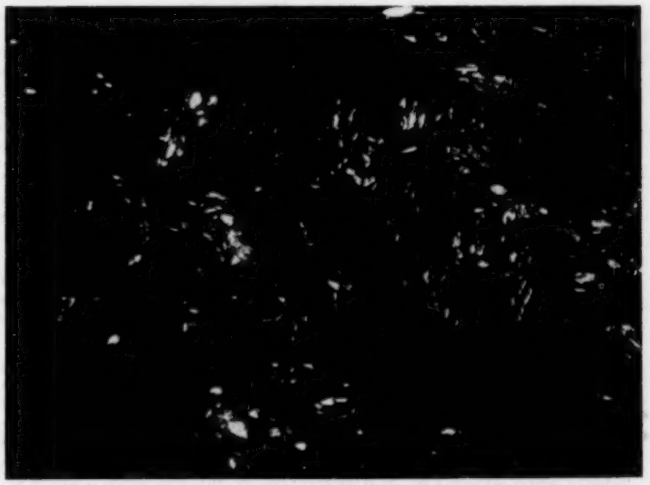


Fig. 2—Talc crystals shown up by polarised light in umbilical granulations.

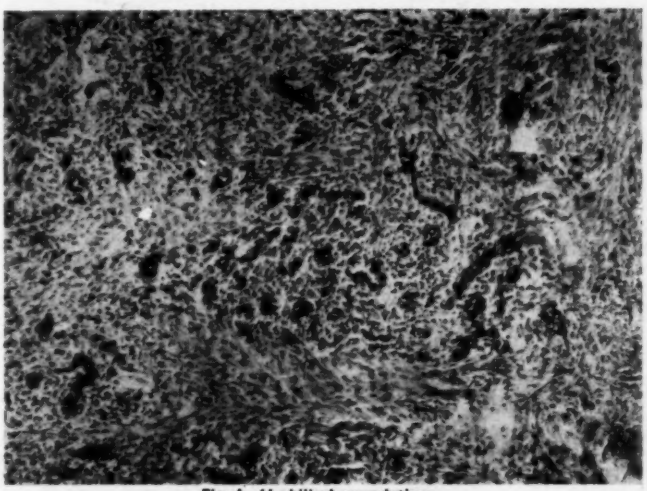


Fig. 1—Umbilical granulations.

umbilicus is soundly healed. One might indeed go so far as to advocate that the routine use of talcum powder should be abandoned because in no circumstances can it be a substitute for proper cleansing of the skin, followed by thorough drying, but in this matter we are concerned with a ritual which is too firmly rooted in tradition to be influenced by considerations such as these.

REFERENCES

Faulds, J. S. (1935) *J. Path. Bact.* **41**, 129.
Feinberg, R. (1937) *Arch. Path.* **24**, 36.
Isbister, C. (1953) *Med. J. Aust.* ii, 576.
McCormick, E. J., Ramsey, T. L. (1941) *J. Amer. med. Ass.* **116**, 817.
Roberts, G. B. S. (1947) *Brit. J. Surg.* **34**, 417.
Shattock, S. G. (1916–17) *Proc. R. Soc. Med.* p. 9.

RENAL COLIC AND PERSISTENT HYPERCALCURIA FOLLOWING SELF-ADMINISTRATION OF VITAMIN D

P. FREEDMAN
M.D. Lond., M.R.C.P.
RESEARCH ASSISTANT,
MEDICAL UNIT, UNIVERSITY COLLEGE HOSPITAL, LONDON

HYPERCALCURIA has become of increasing interest to both physician and surgeon: the physician sees it as an expression of endocrine disorders, biochemical disturbances, and renal pathology; whereas the surgeon is more directly concerned with the increased tendency to renal calcification and lithiasis.

Hypercalcuria and renal colic in the case here reported appear to have been caused by a prolonged course of vitamin D which was self-prescribed. The increased urinary excretion of calcium is still present fifteen months after the vitamin has been discontinued.

Case-report

A male cook, aged 55, was first seen in the casualty department at 5 A.M. with severe pain which had come on suddenly in his left loin and awakened him two hours previously. The pain was severe and colicky and radiated into his left groin. He could not lie still while the pain was present, but there was gradual relief after an injection of pethidine. There was no macroscopic hæmaturia, no disturbance of micturition, and no history of previous similar episodes. No other relevant past history was given at this time, and there was no significant family history.

On admission the patient appeared to be otherwise fit, with no abnormal physical findings in the cardiovascular system or lung fields. Blood-pressure 110/70 mm. Hg. His kidneys were impalpable, and tenderness in the left renal angle rapidly disappeared. There were no other abnormal physical findings. The first specimen of urine passed contained very numerous red cells, occasional pus cells, and no protein. The urine gave a strongly positive Sulkowitch reaction for calcium, and tests for cystine were negative. Further inquiry of the patient elicited a history of taking "vitamin tablets" as a general tonic for the past three years. These proved to be a proprietary vitamin preparation ('Ostelin,' Glaxo) containing 50,000 units (1·25 mg.) of vitamin D (as calciferol) in each tablet, which also contained 105 mg. of calcium and 44 mg. of phosphorus.

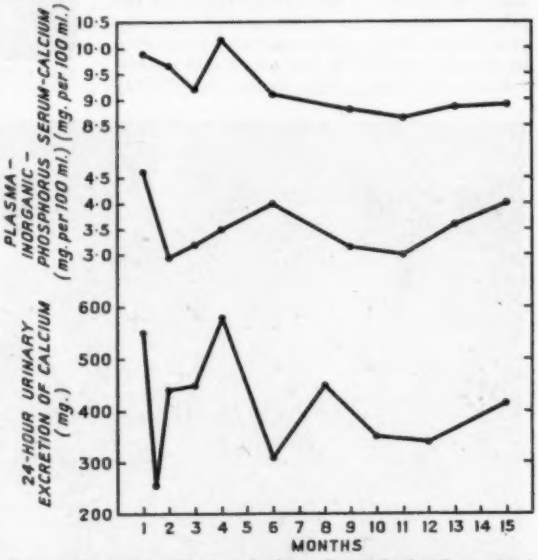
Investigations.—On the day after admission the urine contained 3 red cells per 1/6 field, no pus cells, no casts, and no protein, and was sterile on culture. The blood-urea level was 30 mg. per 100 ml., and the urea-clearance was 93·5% maximum and 88·5% standard. The hæmoglobin was 108%, erythrocyte-sedimentation rate 10 mm. (modified Westergren read in 100 mm. tube) in the first hour, and white-cell count 9800 per c.mm. (differential count normal). The initial values obtained for the serum-calcium level were 10·0 and 9·8 mg. per 100 ml. and plasma-inorganic-phosphorus level 4·6 and 4·6 mg. per 100 ml. Straight radiography of the abdomen and an intravenous pyelogram revealed no abnormality in the urinary tract, and there was good concentration of diodone. Radiography of the chest showed old calcified lesions at both apices, but specimens of sputum contained no acid-fast bacilli. Radiography of the skeleton showed an enchondroma in the fourth proximal phalanx of the right hand, but there was no evidence of generalised disease of bone. The twenty-four-hour urinary excretion of calcium was 550 mg. In view of this high value further investigations were undertaken. The plasma-alkaline-phosphatase level was 11·0 King-Armstrong units per 100 ml., the plasma-electrolyte, carbon-dioxide capacity, and serum-protein levels were normal, and the serum flocculation tests were negative.

Progress.—It was considered clinically that the attack of renal colic was probably associated with his hypercalcuria and with the passage of a small stone, although this was not actually seen. The vitamin-D preparation was discontinued on admission, and a week later the urinary excretion of calcium was 255 mg. in twenty-four hours. The patient was discharged, nine days after admission, on a low-calcium and vitamin-D-poor diet, achieved by a severe restriction of his intake of milk and dairy produce, and has been seen regularly for follow-up during the past fifteen months. Clinically he has remained well and has had no recurrence of renal colic or any symptoms connected with micturition. Repeated estimations of the twenty-four-hour urinary calcium while on a low intake have shown a persistently excessive excretion (see figure) over the accepted upper normal limit of 220 mg. for this laboratory. The diagnosis of renal tubular acidosis was considered unlikely in view of the normal plasma-bicarbonate levels; and the failure, on two occasions, of sodium bicarbonate, in a dosage of 10 g. daily for seven days, to reduce the excessive output of calcium was further evidence against this condition as a cause of the hypercalcuria. The serum-calcium level fell during the early months of follow-up (see figure) and still remains low (8·9 mg. per 100 ml.). The plasma-inorganic-phosphorus level has varied during this period, and, although low values have been recorded (see figure), the most recent value was 4·0 mg. per 100 ml. Repeat estimations have given normal values for the plasma-protein levels, the urine has remained free from protein and is normal on microscopy, and radiologically there is no evidence of calcification in the kidney or of generalised disease of bone. The blood-urea, plasma-potassium, and plasma-bicarbonate levels have remained normal, and the most recent alkaline-phosphatase level is 6·9 King-Armstrong units per 100 ml.

Discussion

Increased urinary excretion of calcium has long been recognised as an important association of calcification within the kidney and of an increased likelihood of calcium lithiasis.

Flocks (1939, 1940) found that the excretion of calcium was raised in about two-thirds of 35 unselected cases of calcium urolithiasis. Furthermore, all patients with recurrent or



Changes in serum-calcium and plasma-inorganic-phosphorus levels and twenty-four-hour urinary excretion of calcium during follow-up period of fifteen months after end of long course of vitamin D.

rapidly growing stones had a high urinary calcium. Many of the patients with calcium stones had a high urinary calcium without any bone disease or evidence of hyperparathyroidism, change in blood-calcium level or blood-phosphorus level, or other demonstrable abnormality of calcium metabolism. These patients, responded to an acid ash diet and to vitamin D with an exaggerated increase in the urinary excretion of calcium.

Albright and Reifenstein (1948), considering the metabolic disorders leading to hypercalcuria, divided them into those associated with hyperparathyroidism, osteoporosis during the stage of progression, renal acidosis, and those in whom no other abnormality was found. This latter group, which they consider is probably the more common, they called idiopathic hypercalcuria, and they drew attention to a " tendency " to a low serum-calcium level in this condition.

Albright et al. (1953) discussed further the problem of idiopathic hypercalcuria. 22 patients had shown hypercalcuria with normal serum-calcium and low plasma-phosphorus levels and, in most cases, evidence of past or present pyelonephritis. There was also a high incidence of stone. These workers suggested that infection damaged the renal tubules, thus causing hypercalcuria, a low serum-calcium level, and, possibly, by an ensuing overaction of the parathyroid glands, a low plasma-inorganic-phosphorus level.

Pyrah and Raper (1955) examined radiologically 216 apparently healthy kidneys removed at necropsy and found small calcified foci in 10% of them. Microscopy of 206 healthy kidneys showed tiny calcified foci in 21%, and this figure might well have been higher if serial sections had been used. These calcified foci were mainly found around the upper collecting tubules, but a few lay within the lumen of the tubules. The origin of these foci, whether in minor pathological lesions which had healed or in temporary biochemical disturbances, was not determined.

In children renal failure is sometimes associated with hypercalcæmia produced by hypervitaminosis D. In the adult, renal damage following vitamin-D administration is sometimes seen after long courses of calciferol given in the treatment of lupus. The serum-calcium level rises, and renal-function tests show considerable impairment of function, often after many years.

Dent (1954, 1956) has surveyed the influence of vitamin D on the excretion of calcium and phosphorus. Among its many actions the vitamin promotes the intestinal absorption of calcium, with a consequent decrease in fæcal calcium, and increases the urinary excretion of calcium even when given in doses insufficient to produce hypercalcæmia. Dent has also drawn attention to the wide range of individual sensitivity to vitamin D.

Care was taken in the present case to exclude the above-mentioned conditions known to be associated with excessive urinary excretion of calcium. The fall in the serum-calcium level is of recent onset because the values were normal when the patient was first seen and declined subsequently. Possibly the long-continued hypercalcuria associated with the administration of vitamin D caused persistent damage to the renal tubules and consequent continued excessive loss of calcium in the urine. The gradual fall of the blood-calcium level suggests that osteomalacia may appear in the future if the excessive excretion of calcium continues, and in this situation further stones and renal calcification are additional potential hazards.

Vitamin D is at present added to many food preparations, in particular those used for infant feeding. Since there is wide variation in individual sensitivity to the vitamin, and since severe toxic effects and persistent renal damage may follow hypercalcæmia and hypercalcuria as a result of excessive vitamin-D action, the advisability of this practice is being reviewed (British Pædiatric Association 1955). The danger is the greater for infants whose parents have been strongly encouraged to give further supplements of vitamin D in the form of cod-liver oil or other concentrates. The possible rôle of abnormal sensitivity to vitamin D in the pathogenesis of idiopathic hypercalcæmia in infants has been reviewed previously (Lowe et al. 1954, Creery and Neill 1954, Bonham Carter et al. 1955).

The present case has shown that not only are the known hazards present during the administration of the vitamin, but also that one complication—i.e., hypercalcuria—may persist for a long time after other signs of overdosage have disappeared. It therefore seems likely that the exhibition of vitamin D, not necessarily in high dosage if combined with abnormal sensitivity, may be one of the possible causes of so-called " idiopathic hypercalcuria," perhaps presenting with its own train of complications long after the period of administration. The history of such a course, if recalled by the patient, will almost certainly have been dismissed by him as irrelevant.

The unrestricted sale of potent vitamin-D preparations may well need review in the light of such considerations.

Summary

A patient is reported who, after prolonged self-administration of vitamin D, was admitted to hospital with renal colic presumed to be due to the passage of a small renal stone.

Hypercalcuria was present without hypercalcæmia and persisted for at least fifteen months after the vitamin had been withheld. This is assumed to have been induced by the vitamin D and to have been the cause of the renal symptoms.

I wish to thank Dr. A. G. Spencer, under whose care the patient was admitted, for permission to publish; Prof. C. E. Dent for his constant help and advice; and Dr. F. V. Flynn and the technical staff of the biochemical laboratory of University College Hospital for the estimations.

REFERENCES

Albright, F., Henneman, P., Benedict, P. H., Forbes, A. P. (1953) *Proc. R. Soc. Med.* **46**, 1077.
— Reifenstein, E. C. jun. (1948) The Parathyroid Glands and Metabolic Bone Disease. Baltimore; p. 261.
Bonham Carter, R. E., Dent, C. E., Fowler, D. I., Harper, C. M. (1955) *Arch. Dis. Childh.* **30**, 399.
British Pædiatric Association (1955) Report of subcommittee. See *Lancet*, 1956, ii, 136.
Creery, R. D. G., Neill, D. W. (1954) *Ibid*, ii, 110.
Dent, C. E. (1954) *In* The Kidney. Edited by A. A. G. Lewis and G. E. W. Wolstenholme, London; p. 242.
— (1956) *Proc. R. Soc. Med.* **49**, 715.
Flocks, R. H. (1939) *J. Amer. med. Ass.* **113**, 1466.
— (1940) *J. Urol.* **44**, 183.
Lowe, K. G., Henderson, J. L., Park, W. W., McGreal, D. A. (1954) *Lancet*, ii, 101.
Pyrah, L. N., Raper, F. P. (1955) *Brit. J. Urol.* **27**, 333.

Preliminary Communication

CYTOPATHIC EFFECT ON PRIMATE AND RODENT TISSUE-CULTURES OF AGENT ISOLATED FROM MEASLES PATIENT

In 1954 Enders and Peebles [1] reported the isolation and passage, in tissue-cultures of human or monkey kidney, of measles virus from the blood and throat-washings of patients. Multiplication of the virus in the cultures was accompanied by characteristic changes in the cells—namely, formation of vacuolated syncytial giant cells in which the nuclear chromatin assumed a marginal position and was replaced centrally by an eosinophilic inclusion body surrounded by a clear halo. In measles patients significant increases in neutralising antibody against the cytopathogenic agent developed. Complement-fixing antigen developed in the nutrient fluid of infected cultures; it reacted with convalescent-phase sera, but not with acute-phase sera, from measles patients.

The present investigation was undertaken with two objects: (1) to isolate from measles patients in London an agent producing cytopathic effects similar to those described by Enders and Peebles [1]; and (2) in the event of success, to grow this agent in cultures of tissues more readily available than human and monkey kidney.

1. Enders, J. F., Peebles, T. C. *Proc. Soc. exp. Biol., N.Y.* 1954, **86**, 277.

ISOLATION OF AGENT FROM CHILD WITH MEASLES

Nose and throat swabs were taken from a measles patient within 24 hours of the appearance of the rash. The swabs were inoculated into the nutrient fluid (medium 199) of a monkey-kidney tissue-culture. After 10 days' incubation at 36°C vacuolated syncytia were observed. With continued incubation the cytopathic lesions increased in size and number. The culture was stained on the 20th day after inoculation and numerous eosinophilic intranuclear inclusions were seen. The nucleoli were preserved.

GROWTH OF AGENT IN CULTURES OF PRIMATE AND RODENT TISSUES

Eleven passages of the agent were made in monkey-kidney tissue-cultures, and cytopathic changes similar to those in the primary culture were seen at each passage level.

Nutrient fluids from monkey-kidney cultures showing typical cytopathic changes were used for inoculating tissue-cultures of human infant kidney (excised), human amnion, human chorion, epithelial-like cells derived from human kidney by Chang,[2] HeLa cells, chick-embryo lung, and the kidneys of a 5-week-old hamster, an 8-week-old mouse, an embryo guineapig, a 5-day-old guineapig, and an adult guineapig. In all these tissue-cultures, except of chick-embryo lung, cytopathic changes developed which, during incubation and on staining at the 10th–20th day after inoculation, were essentially similar to those seen in the infected monkey-kidney cultures. Uninoculated tissue-cultures of each type were incubated and observed, but no similar cytopathic changes were seen in them.

Positive results were obtained in complement-fixation tests using human convalescent measles sera and, as antigens, nutrient fluids from cultures showing cytopathic changes. The results with nutrient fluids from uninoculated cultures were negative.

2. Chang, R. S. M. *Ibid*, 1954, **87**, 440.

COMMENT

There can be little doubt that the cytopathic changes in the inoculated tissue-cultures were due to measles virus. This view is supported by the fact that the primary culture had been inoculated with swabs from a patient in the exanthematous stage of measles; that antigens of the infected tissue-cultures fixed complement in the presence of convalescent measles sera; and that the cytopathic changes were similar to those which Enders and Peebles[1] found in tissue-cultures of human kidney or monkey kidney inoculated with measles virus. Recently, other workers have reported the growth of measles virus in cultured cells of human origin (Jordan,[3] Dekking and McCarthy,[4] Black et al.[5]). The results of the present investigation would seem to indicate that measles virus can be grown not only in cultures of primate tissues but also in those of rodent tissues. Further work will be required to confirm and extend the investigation. It will be of interest to see whether virus from measles patients can be isolated in rodent tissue-cultures, and whether the virus can be serially propagated in such cultures. Progress with this method would permit study of measles virus in the tissues of a small and conveniently obtainable animal, and a gain in knowledge regarding virus specificity.

I thank Dr. C. H. Andrewes for his encouragement and valuable advice; Dr. T. B. Williamson and Dr. G. D. W. McKendrick for facilities for the work; Dr. A. Isaacs, Dr. H. G. Pereira, Miss D. M. Chaproniere, and Mr. L. G. C. Maslen for their interest and help; Dr. A. P. Goffe for monkey-kidney cells; and Mrs. R. Villanueva for technical assistance.

JOYCE WRIGHT
B.A., D.M. Oxfd
St. Ann's General Hospital, London
Member of Scientific Staff, Medical Research Council

3. Jordan, W. S. jun. *Ibid*, 1956, **92**, 872.
4. Dekking, F., McCarthy, K. *Ibid*, 1956, **93**, 1.
5. Black, F. L., Reissig, M., Melnick, J. L. *Ibid*, p. 107.

New Inventions

A DROP-TILT BED FOR THE LABOUR WARD

ABOUT two-thirds of maternal deaths associated with anæsthesia are caused by inhalation of stomach contents. It is usually emphasised that such deaths are avoidable, but there is lack of agreement on the method of prevention.

Gibberd[1] proposes a postural method and describes a labour-ward bed which can be tilted into a head-down position at a moment's notice by a simple movement of the anæsthetist's foot. He says: "The proper management of regurgitation of stomach contents . . . is to recognise it immediately, and immediately to lower the [patient's] head so that postural treatment has been adopted *before* [italics mine] the vomit can be inhaled." The essence of this method is its simplicity, but it cannot be used effectively unless the right type of bed is available. Many labour-ward beds have no tilting device at all; some can be tilted by mechanisms which require manual operation and involve dangerous delay. Delayed action is not enough. Instantaneous action, which will save lives and prevent near fatalities, depends on a *split-second* tilting device operated by the anæsthetist. Gibberd rightly insists on the device being foot-operated so that the anæsthetist's hands are free for the performance of other urgent duties. Head-harnesses for keeping the

1. Gibberd, G. F. *Lancet*, 1955, i, 901.

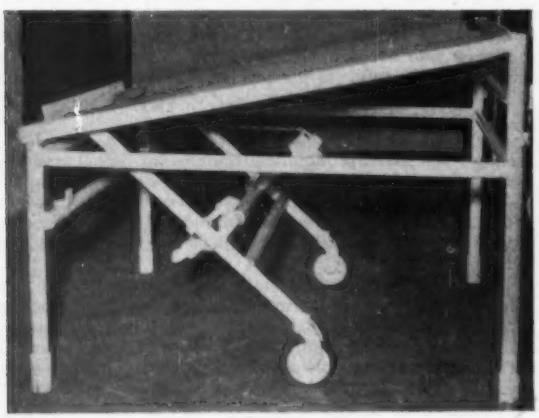


Fig. 1.

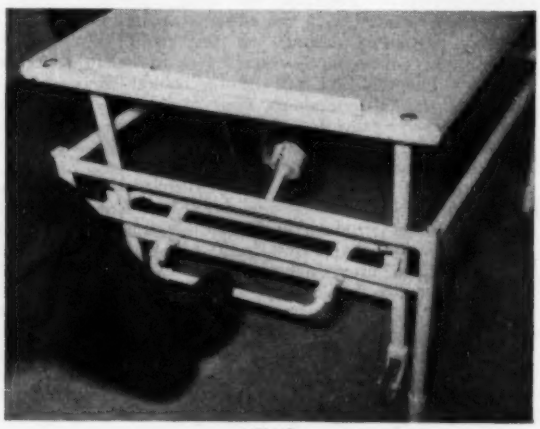


Fig. 2.

anæsthetic mask in position have no place in the labour-ward.

I hope that the bed described here will focus attention on the postural method again and make possible a more general application of the principle of foot-operated drop-tilting.

The bed is made in two sections: a rigid section which supports the patient's legs, and a tilting section. The rigid section (not illustrated) is on castors and can be easily disconnected from the tilting section and wheeled away. A rubber mattress covers each section.

Fig. 1 shows the tilting section in its head-down position. This tilt can also be obtained while the rigid section is in place, the patient's legs remaining on the rigid section while the rest of her body tilts. It is therefore safe to induce anæsthesia before removing the rigid section and placing the patient in the lithotomy position. The lower ends of the lithotomy poles can be seen in their holders.

Fig. 2 shows the locking device being released. The wheel-bearing legs are prevented from running backwards by the lower of the two cross-bars which connect the short rear legs. They cannot run forwards until the locking device is released. This device is kept locked by the cylindrical lead weight. It is released by the anæsthetist placing his foot on the kick-bar with sufficient force to counteract the effect of the lead weight. The two U-shaped side-arms of the locking device are now clear of the cross-bar, against which they are normally held by the weight. One simple movement of the foot unlocks the legs and starts them on their forward journey. The patient, deprived of the support of these legs, drops into a head-down position. Shock is absorbed by two small rubber buffers.

When the tilted platform is lifted back to its normal horizontal position, the chain automatically pulls the legs back to their vertical locked position.

The two holes which can be seen near the rear edge of the tilting platform are sockets for a removable head-rail.

The major problem in design was to achieve stability. Because the top surface tilts by pivoting round a rod which connects the upper ends of the front legs, any forward drag on the top surface will cause these legs to tilt forward. Such drag occurs when traction is applied to the obstetric forceps and when the patient moves, or is moved, forwards on the bed. Any forward tilt of the front legs is transmitted as an upward movement to the lower side-bars, which would lever the short rear legs off the floor. This is prevented by a small metal plate on each wheel-bearing leg projecting over similar plates on the lower of the two cross-bars which connect the short rear legs. Upward movement of these legs being stopped in this way, forward tilting of the front legs cannot take place. The result is complete stability.

This bed is now in use at the War Memorial Hospital in Nakuru, Kenya. It was made locally. The framework is made of British Standard Pipe, and the U-shaped pieces of the locking device are standard one-inch cross-overs.

I wish to thank Mr. Gustav Kramer for presenting the bed to the hospital; Mr. Robert Heller and Mr. Hans Gordon for the constructional work; and Mr. A. G. Kaylor for the photographs.

St. Luke's Hospital, Guildford

G. C. BIRD
M.B. Lond

Reviews of Books

How to Live With Your Nerves

HENRY HARRIS, M.D., D.P.M. Pp. 144. 8*s.* 6*d.*

How to Live With Your Blood Pressure

BADEN BEATTY, M.B., D.P.M. Pp. 142. 8*s.* 6*d.*

How to Live With Your Duodenal Ulcer

ROBERT KEMP, M.D., M.R.C.P. Pp. 111. 8*s.* 6*d.*

How to Live With Your Rheumatism

OSWALD SAVAGE, O.B.E., M.R.C.P. Pp. 142. 8*s.* 6*d.*

Family Doctor books. London: British Medical Association. 1956.

HERE are four essays in the widely practised but difficult—if not dangerous—art of expounding medicine to the layman ignorant of anatomy and physiology.

One of the four is addressed solely to those with a proved duodenal ulcer, and one to sufferers from "rheumatism"—a clinical concept, if scarcely an entity. But we all have a blood-pressure and nerves; we can all start looking at them and wondering about them, if encouraged, and some of us will almost certainly be healthier people and better patients if we know that we know nothing about them and are content to be ignorant than if we have the wealth of information here provided—more especially on blood-pressure.

The crucial experiment of giving these books free to every appropriate reader in, say, Gloucester, while withholding them from all the citizens of Worcester, and shrewdly questioning a good big sample of patients and doctors in each city five years later, cannot be performed; but it is probably fair to say that while a doctor could hand out *Duodenal Ulcer* or *Rheumatism* without hesitation he had best size up his man or woman before giving them *Nerves* or *Blood Pressure*.

What can be said for certain is that all four books are well informed, up to date, and written with the single intention of helping the reader and his doctor.

The Scientific Investigation of Crime

L. C. NICKOLLS, M.SC., A.R.C.S., F.R.I.C., D.I.C., director, Metropolitan Police Laboratory, New Scotland Yard, London. London: Butterworth. 1956. Pp. 398. 50*s.*

THE quality and usefulness of technical books on the scientific investigation of crime have improved remarkably in the past ten years. Paul Kirk, Svensson, and others have set a high standard, and any new book in this field must compete at the same level or fail. Apart from the Hans Gross, which was written for routine police use, no English authority has attempted this task until now.

Mr. Nickolls, whose position as head of the forensic science laboratories at Scotland Yard provides him with abundant material, has made excellent use of it in this quite small and very practical handbook. In the physical sciences the material, though restricted, covers the ground very well. Not everyone will regret that British experience in firearms is too meagre for any forensic textbook from this country to compete with those from other parts of the world where gunplay is more familiar. The section on wood, hairs, and fibres is particularly comprehensive for so small a book. Those who would expect Mr. Nickolls's specialty of forensic toxicology to receive lengthy treatment are put right in the introduction, where it is made quite clear that nothing more than a short review of method will be found in the toxicological section. Those who want to go further into any subject have a full bibliography to help them. For a start, however, this book gives them an authoritative and well-illustrated guide.

The Cytology of Effusions in the Pleural, Pericardial and Peritoneal Cavities

A. I. SPRIGGS, D.M., M.R.C.P. London: Heinemann Medical Books. 1957. Pp. 71. £2 2*s.*

THIS atlas is intended for use "with the standard hæmatological atlases in order to help in the identification of the cells of pleural, pericardial and peritoneal fluid." It is surprising how old this subject is, and Dr. Spriggs considers that it has been neglected because poor techniques have given poor results. With proper technique much more can be made out of the cytology and, in particular, the study of the cells in these effusions may help to disclose malignant conditions.

Dr. Spriggs gives a clear account of his not too complicated technique, which demands nothing not already in the clinical laboratory and uses the standard May-Grunwald-Giemsa blood stain. The results are illustrated in 5 colour plates made from paintings by Gereth M. Spriggs. These plates are very good, clearly printed, with well-reproduced detail; and the cells are represented at a proper size so that they give a true idea of what will be seen in the microscope. There are also 40 photomicrographs in monochrome; these are, on the whole, very good too, though some suffer more than others from the inevitable lack of clarity of high-power magnifications. They certainly convey the variety of appearances

encountered in the different conditions. It is interesting to see that positive diagnostic results were obtained in 71% of pleural or peritoneal effusions due to malignant disease.

The text is purely descriptive, and two chapters are devoted to this important matter of malignant effusions. Dr. Spriggs lists the criteria of malignancy but adds the warning that "none is pathognomonic and in practice conviction comes with experience and not with enumeration of criteria." We agree heartily.

This, then, is a useful atlas which should encourage clinical pathologists to take more care with cytological preparations from pathological exudates, and so extract more information from them.

The Child and the Family

First Relationships. D. W. WINNICOTT, F.R.C.P. London: Tavistock Publications Ltd. 1957. Pp. 147. 12*s.* 6*d.*

IN this book are collected many of Dr. Winnicott's radio talks about babies and young children and their parents.

At his best Dr. Winnicott has a poetic gift of expression, and he is at his best when talking to what he believes to be an unsophisticated audience. When he speaks to the "ordinary devoted mother" or "normal parents" of the immensely important part their normal loving impulses play in the growth of the individual and society, he is to a certain extent idealising his audience. The implication is that any departure from this idealised normal is the result of adverse external influences; the normal mother knows how to deal with her newborn baby unless her self-confidence is shaken by those caring for her. This has been at least partly true—the expert in physical care often does not appreciate how closely interwoven are the physical and psychological in babies and young children. But many would not agree with Dr. Winnicott's criterion of "normality," believing that it is "normal" for parents to feel irritation or anger with their offspring at times, and that the all-loving, all-giving parents would cause their children to feel great guilt. Also it cannot be denied that many of the doubts which beset parents come from within, even if they are sometimes reinforced by the experts. There must be few parents (however "normal") who have not felt that they were at least temporarily losing their way with one or another of their children.

Few who try to help parents and children would not be glad of some of Dr. Winnicott's perceptiveness and gift of communication. This book may be most helpful to those to whom it is not directly addressed—experts on maternal and child care, general practitioners, nurses, obstetricians, and pædiatricians.

Statistics of Therapeutic Trials

G. HERDAN, M.SC., PH.D., LL.D., lecturer in medical statistics, University of Bristol. New York: Elsevier Publishing Co. London: Cleaver-Hume Press. 1955. Pp. 367. 50*s.*

THIS is a disappointing book, although the author has an erudite and novel approach to teaching the application of statistical method to clinical trials.

Instead of the more conventional systematic progress through the development of statistical concepts and techniques with illustrative examples on the way, he has started with a series of practical problems for which he prescribes the appropriate statistical method of analysis. This is an attractive approach, but anyone who had read no other text on medical statistics might find himself at a loss when faced with a situation not covered by the series of prescriptions. By cutting out the mathematics and giving the formulæ dogmatically a deceptive air of simplicity is achieved. The standard deviation, for example, is dealt with in eight lines; and this may lead to a rather mechanical and unrealistic approach in practice. If the rational basis of tests of significance is too briefly emphasised, the discussion of the design of clinical trials is rather long and at times obscure. Those with practical experience in the conduct of clinical trials may be surprised by the author's failure to comment on the limitations of strict alternation or the importance of selection in the interpretation of the published comparison between survival-times after various forms of cancer therapy.

In short, although experienced workers will find some stimulating ideas in this work, it cannot be recommended as an introduction to the subject.

The Adrenal Cortex

I. CHESTER JONES, B.SC., PH.D., lecturer in zoology, University of Liverpool. London: Cambridge University Press. 1957. Pp. 316. 37*s.* 6*d.*

THIS monograph, which treats the subject from the angle of comparative physiology, is particularly valuable since reports on different species are apt to appear in widely different types of specialist journals, and it is only too easy to miss relevant work.

The clinician will be interested chiefly in the first and longest section of the book, which deals with the Eutheria, and in the last sections, where the embryology of the organs is considered and the author attempts to correlate structure and function. In dealing with the Eutheria, after considering the gross and microscopic anatomy of the glands and the chemistry and biosynthesis of their hormones, the author discusses the control of adrenocortical secretion and devotes a long subsection to function. Particularly interesting at present is the section on water and electrolyte metabolism and the possible coördination between the adrenals and the posterior lobe of the pituitary. There is also a useful summary of what are called natural abnormalities of function—i.e., diseases arising from hyper- or hypo-function of the adrenal cortex. The diagrams and photographs are clear and the price is reasonable.

This book will be much appreciated by anyone working in the field of endocrinology.

A Textbook of Psychiatry (8th ed. London: Oxford University Press. 1956. Pp. 745. 35*s.*).—The changes in "Henderson and Gillespie" do not appreciably alter its merits and defects. Edited by Sir David Henderson with the help of Dr. I. R. C. Batchelor, it remains a well-organised, coherent statement of middle-of-the-road psychiatry. Contentious matters are treated with easy tolerance rather than intellectual rigour, and the citation of authorities is somewhat arbitrary. With the advent of Dr. Batchelor, the chapter on epilepsy has been recast and some of the discussion of ætiology amplified; the distinction between schizophrenia and paranoid states, asserted in recent editions, is now confidently treated as established, though one of the three reasons given—that patients with paranoid states "rarely exhibit the gross intellectual and emotional deterioration which is so characteristic of schizophrenia"—is questionable as fact and perhaps contains a *petitio principii*.

Biographical Memoirs of Fellows of the Royal Society (Vol. 2. London: The Royal Society. 1956. Pp. 345. 30*s.*).—Nearly half of these twenty-one masterly biographies deal with medical men or scientists who have worked in close touch with medicine. Each includes an assessment of the contribution made to science, a detailed bibliography of published work sometimes of astonishing length, and a signed photograph of unusual excellence. Of how many scientists could it be said that "the secret of his greatness is probably that he could recognise a problem that could be dealt with by experimental methods, that he could then reduce the experimental technique to something very simple and that in carrying out the experiment he could distinguish the essential points from the confusing details." Physiology is represented by Gleb Anrep, biochemistry by Harold King and Otto Rosenheim, experimental pathology by Charles Martin. Bacteriology has lost O. T. Avery, Alexander Fleming, and Richard Pfeiffer. Patrick Buxton made entomology his life's work, Sheldon Dudley epidemiology, and J. A. Sinton tropical medicine. The biographies cover many subjects, including advanced mathematics, philately, and nonsense verse with an unexpectedly amusing illustration. It cannot be often that a publication of the Royal Society includes representatives of the two senior Services. Sir Sheldon Dudley was medical director-general of the Royal Navy during the 1939–45 war, and Brigadier Sinton did valuable work on malaria for the Army. This series of biographies is of world-wide interest and importance.

A Therapeutic Index (2nd ed. London: Baillière, Tindall, & Cox. 1957. Pp. 156. 12*s.* 6*d.*).—For the new edition of this practical handbook by Dr. C. M. Miller and Dr. B. K. Ellenbogen some sections have been extensively revised and a few new ones added; and the antibiotic dosage tables have been modified.

The Quad picture of all time!

No one will ever forget this delightful unique picture of the four families of British Quads taken on the occasion of the 21st birthday of the Miles Quads. Truly, it makes medical history, and we are justly proud that all these lovely young people were fed on the famous King of foods and Food of kings—Cow & Gate Milk Food. We are proud too of the confidence the Medical profession has in our products. Our Medical Department is always at your service.

A print of this delightful picture is available on application to Cow & Gate, Guildford.

COW & GATE MILK FOODS

GUILDFORD SURREY 5447

STEPS IN A NEW DIRECTION

... *Sodium retention avoided*
... *Little risk of oedema*

... *No potassium depletion*
... *Replacement unnecessary*

... *Greater potency*
... *Reduced dosage*

WHEN **Di-Adreson**
(PREDNISONE)

or **Di-Adreson-F**
(PREDNISOLONE)

is prescribed instead of Cortisone Acetate

Both DI-ADRESON and DI-ADRESON-F are supplied in scored tablets 5 mg. Bottles of 30, 100 and 500.

Full literature available on request.

ORGANON LABORATORIES LIMITED

BRETTENHAM HOUSE, LANCASTER PLACE, LONDON, W.C.2

Telephone: TEMple Bar 6785/6/7, 0251/2. Telegrams: Menformon, Rand, London.

THE LANCET

LONDON: SATURDAY, MARCH 30, 1957

"Withdrawal"

THE choice may not be easy, but it is necessary. Doctors cannot have both the prestige of a profession, whose strength lies in the merits of its case, and the power of a trade union which is organised to apply pressure. In the public mind Dr. Jekyll's status as the beloved physician will not survive his repeated transformation into Mr. Hyde, the medical workman, who is ready to use political force in his own interest.

Granted its premises, the British Medical Association's plan [1] for constraining the Government is a good one: it does not come into action till October, and, even after it begins, its development by stages makes it at first no more than a warning of what is to come. But, though every chance is to be given to the other side to come to terms, the possibility remains that their resistance will harden and that a struggle will take place. In this, we are told, the aim would be to embarrass the Government without inconveniencing the public; yet it is hard to see how the Government would be embarrassed except in so far as the public were inconvenienced. True, no patient would be deprived of medical help; but he would normally be expected to pay for it; and people might be as much upset by this as they would be if, in a railway strike, they were told that their season tickets had been cancelled but they could get to work by paying the railwaymen a special fare. The action recommended by the General Medical Services Committee is not a strike in the sense that services are to be withheld: doctors work for their patients, not for the Government, and they are going to continue this work, though under fresh arrangements of their own. But it would none the less be regarded by the public as a strike, because it is an attempt to secure better pay by threatening to make the paymaster's organisation unworkable. It is well to recognise, too, that sooner or later hostile critics would point to the advantage enjoyed by doctors in such a dispute—namely that, whereas the worker in industry risks his wages when he threatens to walk out, the doctor knows that many of his patients will not dare refuse him fees.

In giving these indications of the awkwardness of combining professional and trade-union techniques, we shall be told that the latter have often been used in the past, *pro re nata*, without affecting the status of the profession, and that now (as sometimes before) they are the only means of getting the Government to pay attention to injustice. But the B.M.A.'s many unquestionable successes have not in fact been gained without cost—though, oddly enough, it is often those who believe most strongly in forceful methods that are readiest to note and deplore a less respectful attitude towards doctors nowadays, just as they are often the people who are particularly keen to keep medicine "out of politics." As for the argument that attention is paid only to negotiators who get tough, we believe, on the contrary, that nothing would be so likely to appeal to the sense of fairness of British Governments as the knowledge that they were dealing with a profession which in no circumstances would use its political weapons. For the present this moral asset has been thrown away, and doctors are urged to embark on a trial of political strength, on a purely monetary matter, in which it is far from certain that public opinion would be on their side.

The handling of medical remuneration by successive Governments has been lamentable: as we said earlier this year,[2] they have behaved not like partners in the enterprise of National Health but like intransigent and short-sighted employers. But the profession is itself to blame for losing opportunities to urge a review which might by now have provided a firmer and more durable basis than the Spens reports.[3] Moreover, the only Government that concerns us at the moment is Mr. MACMILLAN's; and in his short time as Premier he can at least be said to have paid attention and taken action, even if we do not think it the right one. To the man-in-the-street it may well seem that "something on account," and an inquiry intended to produce a permanent settlement, is a sensible way of dealing with an obviously complex problem; and in the present critical industrial situation his sympathies will probably be with the Government rather than with any group which seems to be asking favoured treatment. Actually the profession's case, strong though it is, does not look as overwhelming to the layman as it does to the doctor. Breach of contract? Few outsiders would accept the view that the Labour Government's acceptance of the Spens reports constitutes an automatic guarantee of doctors (and doctors alone) against suffering through inflation. Refusal of arbitration? There is less inconsistency than the B.M.A. imputes to him in the PRIME MINISTER's advocacy of arbitration in the shipyards and his denial of arbitration to doctors. For the doctors' claim is not against an industrial employer but against the Treasury; and, since the size of the claim is such as to affect the level of taxation, no Government who think it their duty to govern would willingly entrust the decision to an independent arbitrator. (How many of us, in Mr. MACMILLAN's place and with his knowledge of the coming crisis in shipbuilding and engineering, and on the railways, would in fact have settled the doctors' claim first, or in full?) When the PRIME MINISTER expresses his faith in "some form" of arbitration he may feel that, so far as doctors are concerned, he has provided the best possible form in the Royal Commission which is already at work. The fear that the terms of reference of this body might prevent its giving due weight to the Spens reports, and to their implications, is clearly removable; and the present Government cannot be accused of altogether rejecting negotiations if they argue that the time for attempting a lasting settlement is *after* the Royal Commission has reported. It is then—perhaps in nine months or a year—that the profession will be able to decide whether the suggested arrangements are satisfactory or whether

1. Outlined on p. 697.

2. *Lancet*, 1957, i, 31.
3. *Ibid*, 1954, i, 1277.

doctors should withdraw from the National Health Service.

The words "withdrawal from the service" are being used in two different senses which need sharp distinction. The kind of withdrawal which we for our part think both mistaken and professionally wrong is temporary: like the industrial strike, it is an interruption of normal work lasting only till one or other side gives way; and when directed against a Government it is an attempt to impose terms on the community by extra-parliamentary means. But the same objection does not, of course, arise when withdrawal is not being used politically; and there need be nothing unprofessional in doctors leaving the N.H.S., either individually or en masse, provided their notice is sufficient and their decision is irrevocable. As to the purpose of the operation, some people are now talking as though a little "direct action" will not only make the Government pay what is claimed but also make them change the service in some beneficial (though usually unspecified) way. Others, who have disliked the N.H.S. from the start, see this as the moment when a new MOSES should invite his people to follow him out of bondage. Before accepting such an invitation, however, general practitioners may well ask for detailed information on life in the wilderness, and they should consider, soberly rather than in anger, the nature of their present discontent.

Apart from the dispute about money, this discontent arises chiefly from a feeling that the relationship of doctor and patient is no longer what it was, and that organisation has made medicine less enjoyable than in the days of purely private practice; also that it favours mediocrity and impedes progress. We may note, however, that in so far as this is true it is not peculiar to the British system: not long ago an American authority was saying that insurance schemes in the United States have altered the relationships of doctors, patients, and hospitals, which are now on a less personal basis [4]; and in a lecture to students another American teacher has been speaking of "present mediocrity" and a degeneration of motive in which "achievement becomes less impelling than security." Very possibly the capitation fee is not in fact the best means of paying the family physician [2]; but even so, its disadvantages cannot all be laid at the door of our Governmental oppressors, since it is the method which the profession itself has preferred to maintain.[5] Given a cessation of the cold war which has been doing so much harm to the service, profession and Government should be able to consider seriously together what alterations in such arrangements can and should be made. That even without such radical alterations there are big opportunities for improving general practice within the service has been proved by the enterprising minority of family doctors who have latterly done so much to raise its standards and increase their satisfaction in their work.

Meanwhile, exacerbation of the cold war must damage not only the service but—even more—the profession. From deep conviction, the B.M.A.'s chairman of council ominously insists that, for the sake of medicine and our children, every practitioner must agree to withdraw: complete unity and loyalty are essential.[6] But, from conviction as deep, many will decline to support a course which, whatever its immediate rewards, cannot but be ultimately harmful. Today the general public still pays the profession the compliment of seeing something amusing, because incongruous, in the action recommended by the B.M.A.: there can hardly be a doctor in the country who has not had to suffer the greeting of some humorist: "Hullo doctor! You on strike?" But if current emotion prevails over traditional wisdom, and practitioners follow the fashion of industrial disputes, such action will never seem incongruous again; and one of our most valuable if least ponderable possessions will have been lost. Instead, the real need now is twofold—that the Government should restore confidence in the Government and that the profession should restore confidence in the profession. Only then will they be able to work together to the same important ends.

4. *New York Times*, Feb. 17, 1957.
5. See *Medical World Newsletter*, March, 1957.
6. See *Times*, March 25, 1957.

Phosphatases and Prostatic Carcinoma

ENZYMES which split organic phosphates and are most active around pH 5—"acid phosphatases"—are present in many human tissues, but their concentration in the adult prostate is several hundred times greater than in other organs.[1] This high prostatic level is not present before puberty, and has been demonstrated only in man and monkeys, and to a lesser degree in dogs; it is not found in cats, rabbits, guineapigs, or rats.[2] In human seminal fluid, acid-phosphatase levels are even higher than they are in the prostate.[2] The physiological function of this enzyme is unknown, but, as we noted earlier,[3] the acidity which is most favourable for its action corresponds to that of the vagina at the time of ovulation. The subject of prostatic acid-phosphatase levels in serum is complicated by differences in methods of assessing activity and in the range of phosphatases measured. Not all of the acid phosphatase in the serum comes from the prostate. Of particular importance is the red-cell acid phosphatase, the serum level of which rises sharply if hæmolysis occurs. The method of ABUL FADL and KING [4] involves inactivation of this fraction, but not of the prostatic fraction, by formaldehyde. ABUL FADL and KING [5] also reported the almost specific inactivation of prostatic acid phosphatase by L-tartrate—a means of differentiation which has been found to be of value [6] but has not yet been so widely used as their formaldehyde method.

In 1938, GUTMAN and GUTMAN [7] described raised serum-acid-phosphatase levels in patients with prostatic carcinoma; and their work has been confirmed and extended by many others.[8–13] Using the formaldehyde method, MERIVALE [12] found that 22 out of 23 patients with carcinoma of the prostate had serum levels above 3 units per 100 ml., 15 of them above

1. Kutscher, W., Wolbergs, H. *Hoppe-Seyl. Z.* 1935, **236**, 237.
2. Sullivan, T. J., Gutman, E. B., Gutman, A. B. *J. Urol.* 1942, **48**, 426.
3. *Lancet*, 1945, i, 790.
4. Abul Fadl, M. A. M., King, E. J. *J. clin. Path.* 1948, **1**, 80.
5. Abul Fadl, M. A. M., King, E. J. *Biochem. J.* 1949, **45**, 51.
6. Ozar, M. B., Isaac, C. A., Valk, W. L. *J. Urol.* 1955, **74**, 150.
7. Gutman, A. B., Gutman, E. B. *J. clin. Invest.* 1938, **17**, 473.
8. Huggins, C., Scott, W. W., Hodges, C. V. *J. Urol.* 1941, **46**, 997.
9. Wray, S. *Lancet*, 1945, i, 783.
10. Woodard, H. Q. *Cancer, N.Y.* 1952, **5**, 236.
11. Herbert, F. K. *Quart. J. Med.* 1946, **15**, 221.
12. Merivale, W. H. H. *Guy's Hosp. Rep.* 1951, **100**, 223.
13. Wray, S. *J. clin. Path.* 1956, **9**, 341.

5 units. In contrast, of 101 patients with other prostatic or non-prostatic conditions, 19 had levels above 3 units per 100 ml., and only 5 of them above 5 units. By the same method, WRAY [13] noted levels above 3 units per 100 ml. in 43 out of 73 patients with prostatic carcinoma, but only in 1 out of 427 with other conditions. Various explanations have been suggested for the normal levels often found in proved carcinoma of the prostate. It is possible that "barriers exist in the normal prostate gland that prevent the escape of acid phosphatase into the circulation" [10] and that invasion or metastasis is necessary before the serum levels rise.[2 8] Production of the enzyme may cease in anaplastic growths [2]; and previously raised blood-levels may be temporarily much reduced during intercurrent fever.[8] An acid-phosphatase inhibitor has been demonstrated in some cases.[14] Whatever the reasons, normal serum-acid-phosphatase levels cannot be taken as evidence against a diagnosis of carcinoma of the prostate. But levels between 3 and 5 units per 100 ml., by the formaldehyde method, should be regarded as suspicious and levels above 5 units as strong evidence for such a diagnosis. Urinary retention,[13] prostatic massage,[15] liver disease, and Paget's disease of bone [4 11] may all, however, give rise to "false-positive" results. The effect of œstrogen therapy on prostatic carcinoma with high initial serum-acid-phosphatase levels can be judged by following the return of these levels to normal.[2 9]

A phosphatase active at an alkaline reaction is related to bone production.[16] Raised serum-alkaline-phosphatase levels are found in many bone diseases, including secondary malignant disease,[17] and in obstructive jaundice.[18] Workers who have studied alkaline as well as acid phosphatase in serum in relation to carcinoma of the prostate have generally found that alkaline phosphatase is sometimes increased but it is not of much clinical value.[8] WRAY, however, lately recorded characteristic patterns of behaviour of plasma-alkaline-phosphatase levels after œstrogen treatment of prostatic carcinoma.[13] When the plasma-alkaline-phosphatase value was initially normal, a rise started immediately after stilbœstrol therapy began. After reaching a peak, the value fell to normal more slowly. When the alkaline phosphatase was much raised at the start there was an initial fall coinciding with the start of stilbœstrol, but after a few days it began to rise again and reached a peak above its initial value within thirty to forty days. Thereafter there was a gradual fall, as in patients with initially normal alkaline-phosphatase levels. WRAY found these changes helpful in confirming the diagnosis of metastasising prostatic carcinoma, in indicating the presence of unsuspected secondary deposits, and in judging the effects of treatment. In at least 1 patient, failure of the expected pattern to appear was followed by the discovery that the primary tumour was bronchial not prostatic. Such findings, if confirmed, will provide a useful supplement to acid-phosphatase studies in the diagnosis and management of carcinoma of the prostate.

14. Hudson, P. Progress Report, Department of Urology, Columbia University, 1954.
15. Hock, E., Tessier, R. N. *J. Urol.* 1949, **62**, 488.
16. Robison, R. *Biochem. J.* 1923, **17**, 286.
17. King, E. J., Delory, G. E. *Postgrad. med. J.* 1948, **24**, 299.
18. Sherlock, S. *J. Path. Bact.* 1946, **58**, 523.

University Apartheid

WHEN the United States Supreme Court decided in 1954 that, for white and coloured students, "separate educational facilities are inherently unequal," it was making an observation as relevant to South Africa as to the United States. In the same way that the Jim Crow colleges and schools acquired an inferior status and a reputation for poor training, indifferent staff, and inadequate funds, South African non-European institutions have been handicapped in comparison with those for whites; and neither schools nor colleges "for non-Europeans only" have reached anything like European levels. At the "mixed" universities of Cape Town and Witwatersrand European and non-European students have been given opportunities that were as nearly equal as seemed possible. For medical graduates, the rewards of qualifying may be less (African, Coloured, and European interns, for instance, working at the same hospital, are paid at different rates), but the degrees of all students are nevertheless equal. These mixed universities have been a healthy feature of South African life, for they have provided one of the few social meeting-places for young men and women of different races. A spirit of racial coöperation has distinguished these students from their contemporaries, white and black, of segregated universities in the country, and the main opposition to segregated university education comes from these universities and their graduates.

When, in 1951,[1] the Durban medical school was established as part of the Natal University, it represented to some extent a compromise between mixed and segregated institutions. Natal University had students of all races, but conducted parallel classes for Europeans and non-Europeans, thus accepting internal segregation. In the hope of those who had worked for its establishment, the Durban medical school was to be "primarily non-European," but not exclusively so. The Union government, however, offered to take full financial responsibility for the school, and it made the condition (reluctantly accepted by Natal University) that only non-Europeans were to be admitted to the school, except when special permission was granted by the minister of education. Moreover, to further the aim of segregation, bursary-loans were offered to medical students on the condition that bursars undertook to confine their practice to non-Europeans and to work only in areas approved by the South African government. One of the government's objects in developing the Durban medical school was to enable it to remove non-European medical students from the mixed universities and offer them alternative places in Durban. The minister of education specifically promised that the Durban school, though segregated, would be equal to the white institutions; and this makes developments at Durban of crucial interest to multiracial societies everywhere: it provides one more experiment in segregated education.

Men and women of distinction were attracted to the posts at the Durban school, partly because of its association with the university, partly by the promise of stimulating teaching and research in a non-European school. All were completely determined that no

1. Report on the Government's intended action to remove the Faculty of Medicine from the University of Natal. Durban Medical School, March 4, 1957.

inferiority in standards or status would be tolerated. Natal University was closely concerned in the development of the medical curriculum, and a seven-year degree course was planned, with several interesting features. The preclinical years include courses in history, sociology, psychology, and a language. The department of social, preventive, and family medicine (sponsored by the Rockefeller Foundation) gives the medical student, throughout his last three years, practical and theoretical training in family practice, with all its social and psychological implications. The medical school has encouraged interesting educational methods and research programmes relevant to modern medical education and to problems of health and disease in Africa. The record of teaching and research in this young medical school has been outstanding. But, perhaps because of the segregation policy of Natal University, the parallel classes, and the separate student representative bodies, the Durban medical school could not make the same contribution to better relations between the races as the mixed universities, though non-white students—African, Indian, and Coloured—enjoy the advantages of association in class and residence. As a constituent of Natal University, and with its high academic reputation, however, the school stands out in South Africa as an institution for non-Europeans that is on a par with similar schools for white students. This itself was a significant achievement.

Unhappily, it is now reported that the South African government has decided on complete segregation for South African universities.[2] It has announced legislation to close Witwatersrand and Cape Town Universities to non-Europeans; and the Durban medical school is no longer to be a constituent of Natal University. Instead, the University of South Africa (at present a correspondence college) is to become the examining body for the medical school, and the minister of education will control its policy, including the appointment and discipline of its staff. Members of the staff, it is said, will be subject to dismissal if they "publicly comment adversely upon the administration of any department of the Government . . ." or if they are associated with propaganda calculated "to cause or promote antagonism among any section of the population of the Union against any other section of the population . . ." or "to impede, obstruct, or undermine the activities of any Government department." Thus, the medical school will become a State department and the independence of its teachers will be destroyed. The University Apartheid Bill provides for Bantu colleges for Bantu, Coloured colleges for Coloureds. How this will be achieved in Durban is still not known. Strong protests have come from many quarters, medical and academic, and the government's action, taken without consultation, is regarded as a serious invasion of university autonomy. University independence has been much treasured, the more so in the stress of the complex South African situation. And many hold that to alter the character of the medical school in this way is to break faith with staff and students.

In South Africa, medical schools have evolved and developed in the universities and they owe their vitality to this association. There is no parallel in South Africa to the medical school growing up around a teaching hospital, nor is there anything comparable to the Royal Colleges in this country. In Natal, the association with the university has been particularly important, firstly, because its potentialities attracted staff of high ability, in spite of the restricted student body, and secondly, because a small staff and a small group of students needed all the stimulus and assistance that other specialists could offer. Thus, the psychology course, spread over two years, is the best the university could devise for the needs of medical students, though on paper there is only one part-time lecturer responsible for this course. The University of South Africa is not comparable to a university in this sense, and there seems no doubt that to reduce the medical school to the level of a State department is to destroy its claim to equality with the other medical schools. It will lose its university status and, as the published protests have made clear, it will lose the confidence of staff, students, and the medical profession. Posts at a school thus debased and restricted are unlikely to attract teachers of standing.

With Witwatersrand and Cape Town reserved for Europeans and the Durban medical school under the minister of education, South Africa achieves total segregation in the training of its doctors. Many fear that the standard of training of the non-European doctor will be lower than that of his white colleague, and the South African Medical and Dental Council, which has not so far been prepared to admit dual educational standards for doctors, will, it is hoped, stand firm on this point. The South African government is clearly determined to impress its policy of racial segregation on every corner of the Union, and nurses have lately joined those who have permitted racial divisions to be made in their organisation. There can be little hope of reversing this manifestation in Durban; but the Medical and Dental Council will be widely supported, in South Africa and in many other countries, if it continues to insist on the maintenance of high teaching standards. Those in positions of influence in the medical profession in South Africa will, we hope, realise how much they stand to gain in the esteem of their colleagues all over the world if they speak out boldly against this attack on the freedom of university and doctor.

2. *Times*, March 14, 1957.

Research Beyond the Tweed

THE Scottish Hospitals Endowments Research Trust administer a fund of well over £2,000,000, transferred to them from the endowments of the old Scottish voluntary hospitals. The income from this sum (over £90,000) is used to foster medical research, and in their first report[1] the Trust set out their powers and duties and their approach to their functions. Much care is taken to avoid duplication of work and the Trust keep in close contact with bodies making similar grants. They hope that universities and hospitals will continue to finance research from their own funds; the Trust favour applications made after preliminary work has been done. Major apparatus bought by grants remains the property of the Trust, to ensure that it is put to good use (elsewhere if need be) when the project for which it was bought has been finished. The Trust do not finance the purchase of normal basic laboratory equipment. Before making any grant the Trust consult the Scottish Advisory Committee on Medical Research. The seven trustees, whose chairman is Sir John Maxwell Erskine, hope that Scottish people will remember the Trust when they consider donations or bequests for research.

1. Scottish Hospitals Endowment Research Trust. First Report. H.M. Stationery Office, 1957. Pp. 18. 1*s*. 3*d*.

Annotations

HUMAN ANTIHÆMOPHILIC FACTOR FOR THERAPY

WE have known for a long time that classical hæmophilia is associated with absence of a factor normally present in human plasma. In 1937 Patek and Taylor,[1] working in Boston, Massachusetts, obtained from normal human plasma a globulin fraction with enhanced antihæmophilic activity. Work at the same school showed eight years later that the antihæmophilic factor was associated with fibrinogen,[2] and then, in 1946, that the factor could be separated from fibrinogen.[3] It seemed as if the preparation of a dried frozen human antihæmophilic factor, readily available, after simple solution, for administration to the bleeding hæmophilic patient, was in sight. But unexpected technical difficulties connected with the exceptional lability of antihæmophilic globulin, and causing unpredictable inactivation of the fractions, have prevented the issue of such a preparation so far. For the treatment of hæmophilia we have had to rely on transfusion of fresh blood or, more recently, of fresh plasma quickly separated from the cells and frozen at −20°C. Such precautions are necessary because antihæmophilic activity falls off rapidly in blood stored in the usual way at 2–4°C; it is reduced by at least 50% after twelve hours under ordinary conditions.

In an effort to overcome this difficulty preparations of antihæmophilic factor from the blood of animals have been tested, and these can have high activity. Macfarlane et al.[4] used a bovine antihæmophilic globulin; Fraenkel and Honey[5] recorded the successful treatment of a wounded hæmophiliac with an antihæmophilic globulin prepared from pigs' blood. But these animal preparations have a strictly limited value because they are foreign proteins and repeated administration soon leads to reactions that can be dangerous. Accordingly the article on p. 647 of this issue by Dr. R. A. Kekwick and Dr. P. Wolf, describing preparation of an effective concentrate of human antihæmophilic factor, is of great interest, representing what we hope is the penultimate step along a surprisingly long road. It is not quite the end, because their preparation still contains fibrinogen.

Kekwick and Wolf point out that progress in the preparation of concentrates of antihæmophilic factor was much accelerated when adequate methods of assaying antihæmophilic activity were developed. The thromboplastin-generation test of Biggs and Macfarlane[6] was the first in the field, but Kekwick and Wolf prefer the method, recently described by Wolf,[7] which provides a simple numerical value related to the prothrombin conversion of recalcified plasma. This method uses an artificial substrate, resembling hæmophilic plasma, which is prepared from the supernatant solution left after precipitation of fibrinogen and antihæmophilic globulin from fresh normal plasma. By this method the level of antihæmophilic factor in fresh normal citrated plasma is 8–18 units per ml. (average 12·5 units per ml.), and in classical hæmophilia the level is usually less than 3 units per ml. This technique enabled them to assay quantitatively the antihæmophilic activity of the concentrates. Another technical advance that has helped this work is the refrigerated centrifuge; most of the manipulations involved were carried out at temperatures near freezing-point. The final products were dried from the frozen state at −20°C and stored at this temperature. The product Kekwick and Wolf have used has about ten times the activity of normal plasma; the protein content is about 2·2 g. per 100 ml. and the viscosity of an appropriate solution in distilled water is so low that intravenous administration presents no difficulties. About 70% of this protein is fibrinogen; the problem of separating antihæmophilic factor from fibrinogen, and at the same time ensuring good recovery of an active material, has not yet been satisfactorily solved.

They report results in 6 patients with hæmophilia; in 3, extraction of teeth was undertaken. The volumes of antihæmophilic-factor concentrate used varied from 100 to 300 ml. (corresponding to 1 to 3 *litres* of fresh plasma), and these relatively small volumes helped to avoid overloading the circulation. Assay of antihæmophilic-factor activity in the recipient's plasma showed mostly a satisfactory rise after administration of the concentrate. Not unexpectedly it was much harder to raise the patient's plasma-antihæmophilic-factor level when actual hæmorrhage was occurring; for example, in one incident where the concentrate was given to a patient who had alimentary-tract bleeding, 60% of the administered antihæmophilic factor was immediately used up.

No resistance to this form of therapy has appeared so far; one patient had repeated doses of one of their preparations over five months. But Kekwick and Wolf insist that there are still many difficulties. We cannot, it seems, expect just yet to replace blood-transfusion by injection of antihæmophilic-factor concentrate in the routine treatment of hæmophilia. Antihæmophilic globulin is susceptible to handling even at low temperatures. All the steps of the preparation must be carried out aseptically to avoid final filtration, with its inevitable losses. They point out, too, that the average hæmophilic patient who is bleeding requires a dose of antihæmophilic factor equivalent to 2 litres of fresh human plasma derived from about seven blood donations. There are thought to be about 2000 hæmophiliacs in this country, and a single annual treatment for each would involve processing plasma from 14,000 blood donations. Such a manufacture, they say, "presents a formidable problem, whose solution is not yet clear." Perhaps the best to be expected at present is that the special centres which undertake the care and treatment of hæmophilic patients will carry a small stock of the frozen dried antihæmophilic factor for emergency use; it keeps for several months. Meanwhile, other tissue sources of antihæmophilic globulin are being explored; for instance, Nour-eldin and Wilkinson[8] have prepared from brain tissue antihæmophilic globulin which was free from fibrinogen.

These special preparations of antihæmophilic factor are of value only to patients with classical hæmophilia; such fractions are useless in the clinically indistinguishable Christmas disease. If, therefore, a patient with "hæmophilia" is admitted as an emergency case to hospital, and it is not known whether he has hæmophilia or Christmas disease, he should be treated by transfusion of fresh blood until the diagnosis has been clarified by the thromboplastin-generation test.

BERYLLIUM POISONING

POISONING by beryllium is rare in this country, but in the United States over 500 case-records have been collected and are now available for study at the Massachusetts General Hospital. Hardy[9] has used this unique material to investigate one of the most interesting features of the disease, its relationship to sarcoidosis—or, as some would say, to other varieties of sarcoidosis. Acute beryllium poisoning has almost been eliminated by better protection of workers and it is only the chronic

1. Patek, A. J., Taylor, F. H. L. *J. clin. Invest.* 1937, **16**, 113.
2. Minot, G. R., Davidson, C. S., Lewis, J. H., Tagnon, H. J., Taylor, F. H. L. *Ibid*, 1945, **24**, 704.
3. Lewis, J. H., Tagnon, H. J., Davidson, C. S., Minot, G. R., Taylor, F. H. L. *Blood*, 1946, **1**, 166.
4. Macfarlane, R. G., Biggs, R., Bidwell, E. *Lancet*, 1954, i, 1316
5. Fraenkel, G. J., Honey, G. E. *Ibid*, 1955, ii, 1117.
6. Biggs, R., Macfarlane, R. G. Human Blood Coagulation. Oxford, 1953.
7. Wolf, P. *Brit. J. Hæmatol.* 1956, **2**, 386.
8. Nour-eldin, F., Wilkinson, J. F. *Ibid*, p. 433.
9. Hardy, H. L. *Amer. Rev. Tuberc.* 1956, **74**, 885.

form that is likely to cause diagnostic difficulties. Workers may be exposed to beryllium during extraction of the metal or production of its alloys, in the manufacture of fluorescent lamps and tubes, in atomic-energy development, and in certain ceramic operations. Beryl ore is not harmful, but beryllium itself and certain of its oxides and acid salts, especially the fluoride and sulphate, are toxic. As in other types of sarcoidosis, the granulomas have been found in the liver, spleen, kidney, myocardium, skin, lymph-nodes, pleura, and lung; but no eye lesions, such as iritis and uveitis, have been reported, nor have lesions been found in the tonsils and parotid glands. There are other differences from sarcoidosis. So far no case has been found in the American records in which there was radiographic evidence of enlarged hilar nodes without abnormalities in the lung fields, nor have cystic changes been found in bones. The prognosis of beryllium poisoning is worse than that of sarcoidosis. Although there may be spontaneous remissions, some respiratory disability and radiographic abnormality persist. The history of possible exposure to beryllium and the distribution of the abnormalities may make the diagnosis highly probable, but spectrographic or chemical detection of beryllium in the lesions is the only conclusive finding.

Hardy points out that the term "berylliosis" is confusing. It is an ugly word and can easily be corrupted to "berylosis," which is misleading, for it wrongly incriminates beryl as the toxic agent. She suggests that "berylliosis" should disappear and that the disease should be called "beryllium poisoning"—a welcome suggestion.

THE FLOPPY INFANT

A RECENT newcomer to the group of muscle disorders in infants is the congenital myopathy described by Shy and Magee.[1] They describe a family in which there were five affected persons, four of them male, in three generations. The abnormality was noted at birth, or within a few months, as hypotonia and weakness of the legs, and in one instance the mother said that fœtal movements had been less noticeable than during a normal pregnancy. There was weakness of the proximal muscle-groups, more severe in the legs than the arms, and this led to delay in walking. In one patient the sternomastoids and orbicularis oculi were weak. Unlike most myopathies, however, the disease was not progressive. Biopsy showed aberrant fibrillary bundles in the centre of almost every muscle-fibre, which Shy and Magee believe are characteristic in anatomical arrangement and histochemical reactions.

This disorder must be distinguished from other causes of primary muscular hypotonia in infants, notably Werdnig-Hoffmann's disease, in which muscular weakness affects particularly the proximal muscles and begins within the first year of life. Though Werdnig-Hoffmann's disease is also familial, it usually appears in siblings rather than in successive generations, and steady deterioration leads to death within a few years. The primary lesion lies in the spinal cord affecting the anterior horn cells and ventral roots, and those who prefer pathological terms maintain that the condition should now be called "infantile spinal muscular atrophy." The other label which is attached to limp and floppy babies is amyotonia congenita. No firm pathological basis has been established for this condition, and this is not surprising, for Walton,[2] who followed up 109 cases diagnosed at major hospitals as amyotonia congenita, showed that they represent a wide variety of pathological conditions. He recommends that the term "amyotonia congenita" should be abandoned or used only to describe a clinical syndrome. Nevertheless, 17 of his 109 cases resembled the condition described as amyotonia congenita by Oppenheim.[3] There seems little reason, therefore, to abandon the original term, but the diagnosis should be made with great caution and should be followed up to make certain that an alternative diagnosis does not present itself—myopathy, polymyositis, cerebral palsy, mental defect, or skeletal or nutritional disorders. To this list Chambers and MacDermot [4] have lately added polyneuritis, which they think was responsible for the picture of amyotonia congenita in 3 children they studied.

None of these conditions is common. Nevertheless it is important that they should be distinguished from each other, since, in some, treatment may considerably influence the outcome.

1. Shy, G. M., Magee, K. R. *Brain*, 1956, **79**, 610.
2. Walton, J. N. *Lancet*, 1956, i, 1023.
3. Oppenheim, H. *Mschr. Psychiat. Neurol.* 1900, **8**, 232.

GASTRO-ENTERITIS IN UGANDA

MANY doctors come from other parts of the Commonwealth to Britain for postgraduate training, and they welcome, among other things, the opportunity to meet specialists working with new techniques and to see other aspects of research. As we remarked a few years ago,[5] this traffic is predominantly one-way and there is much to be said for arranging matters so that more young British doctors can have the advantage of experience abroad; and more of them would be ready to go if they were sure that they would not thereby lose a chance of promotion at home and if they were helped to take their families with them. They would learn much—perhaps not least to appreciate the difficulties that face some of their Commonwealth colleagues. We would like to see an extension of the existing arrangements for exchanges of senior registrars with other Commonwealth hospitals; and we welcome, therefore, as a sign of the value of such exchanges, the recent paper by Luder [6] from Mulago Hospital, at Kampala in Uganda, for it springs from that hospital's association with the Hospital for Sick Children, Great Ormond Street.

In an inquiry into the diarrhœa and vomiting syndrome in African children in Uganda, Luder analysed the results in 100 consecutive children admitted to Mulago Hospital. Many were moribund on admission, and there was seldom a single cause. They were treated by the unusual method of re-establishing normal feeding as soon as the diarrhœa showed signs of diminishing, often two days after admission to hospital, and there was no intermediate stage of dilute feeding. 29 patients were fed intravenously, but the mean stay in hospital in all 100 cases was still only just over five days. Some children, however, were removed from hospital before they had been fully cured, and 12 died, 10 within twenty-four hours of admission, which partly explains the extremely short mean stay in hospital. Nevertheless, 60 of the children were well in three days.

Todd and Hall [7] were the first to show, in a carefully controlled trial, the value of *chemoprophylaxis* of infantile gastro-enteritis due to the specific serotypes of *Escherichia coli*. More recently,[8] they found that *chemotherapy* was of little use in mild infantile gastro-enteritis, except when it was due to the specific serotypes of *Esch. coli*, when it was of very definite value. This finding emphasises the importance of looking for these organisms, if only to help the clinician decide which patients would probably benefit from antibiotic treatment. Luder did not look for these serotypes, but it seems unlikely that they caused many of the infections he investigated: the patients did not come from slums or institutions, the course of the illness was shorter, and in 75% the fæces contained pus and blood, which are rare in enteritis due to *Esch. coli*, but not uncommon in salmonella and shigella infections. Cultures were made from only 76 specimens, and these were taken from rectal swabs, which many workers have found less satisfactory than fæces. Luder does not say whether carrier-medium was used to transport the specimens, or what interval elapsed

4. Chambers, R., MacDermot, V. *Lancet*, Feb. 23, 1957, p. 397.
5. *Ibid*, 1952, i, 41.
6. Luder, J. *J. trop. Pediat.* 1956, **2**, 115.
7. Todd, R. McL., Hall, E. G. *Brit. med. J.* 1953, i, 1359.
8. Todd, R. McL., Hall, E. G. *Arch. Dis. Childh.* 1955, **30**, 345.

between taking and culturing the rectal swabs, so it is hard to assess the importance of the information that only 9 shigella and no salmonella strains were isolated.

One aim of Luder's investigation was to determine "whether clinical observation or simple clinical pathological tests, suitable for poorly-equipped tropical hospitals, would enable cases to be subdivided into groups with possible ætiological significance"; and this question was apparently answered because simple pathological tests seemed to provide inadequate evidence to help his clinical judgment. Though his work has produced some interesting data, the very fact that it was limited to simple clinical pathological tests has restricted its usefulness.

ROVSING'S OPERATION

FOR nearly fifty years the place of surgical decompression in the treatment of polycystic disease of the kidneys (Rovsing's operation) has remained a controversial subject. Variations in the extent and behaviour of the disease and the lack of reliable information about postoperative renal function have made the results hard to assess. Moreover, for patients with advanced disease, the operation carries a high mortality. In a recent review of 18 cases treated surgically, however, Yates-Bell [1] drew attention to the symptomatic improvement and prolongation of life that can be achieved. In 2 of his patients it was possible to compare the beneficial effect of unilateral decompression with the deterioration in the other kidney (as shown by excretion pyelography) after periods of eleven and nineteen years respectively. Several other patients' symptoms were relieved, and in some there was a transient reduction of hypertension. The immediate effect of the operation on renal function, however, was always adverse, though some later improvement could often be expected. For this reason, in Yates-Bell's view, surgical treatment has little place in advanced polycystic disease with severe renal failure and should be reserved for early cases and those in which there is pain or recurrent hæmaturia.

The immediate and often dangerous deterioration of renal function which follows exposure of the kidney and decompression of the cysts has in the past been ascribed largely to postoperative œdema and subsequent fibrosis of the residual renal tubules. A preliminary report by Patton and Bricker,[2] however, indicated that many of the cystic nephrons retained some function, and their destruction at operation may well contribute to renal failure. This thesis has lately been extended by a thorough study of renal function in 4 patients subjected respectively to bilateral decompression, unilateral decompression, surgical exposure only, and conservative treatment.[3] After decompression clearance values fell immediately and were still low at the end of a year; but there was no notable change after simple exposure or conservative treatment. Bricker and Patton conclude that decompression is not a satisfactory means of improving renal function and may even do permanent harm.

The place of Rovsing's operation depends, therefore, on the respective values of these clinical and laboratory studies; and each individual case must be carefully assessed. Everyone agrees that advanced cases should not be operated on, but a reasonable argument may be made out for decompression in patients with satisfactory renal function who are having symptoms. On the other hand, symptoms are often transient, though recurrent, and they often respond to conservative measures. With regard to prognosis, it is doubtful, in the light of laboratory and genetic investigations, whether surgical treatment can, in general, influence survival. Inquiries into the familial disease indicate wide variations in its natural course, often apparently related to the average prognosis of affected members in the family concerned.[4] Any apparent prolongation of survival by operation must, therefore, be considered from this aspect and preferably substantiated by serial tests of renal function. The position is to some extent analogous to that of bilateral "staghorn" lithiasis; though slow deterioration of renal function is the rule in this condition, operation is often best avoided unless serious symptoms demand it.

1. Yates-Bell, J. G. *Lancet*, Jan. 19, 1957, p. 126.
2. Patton, J. F., Bricker, N. S. *J. Urol.* 1954, **72**, 285.
3. Bricker, N. S., Patton, J. F. *New Engl. J. Med.* 1957, **256**, 212.

SOME QUESTIONS

AMONG the flying spray of political persiflage some important questions were asked, if not answered, in the recent debates on the social services, the latest of which is reported on p. 690. Freed from party undertones and emotional overtones, they reflect the real difficulties which beset the Welfare State today. Can we afford to spend so much on the social services? Does the falling value of money mean that we are in fact spending less on them? Has their proportionate share of the national income fallen? How should the money be collected? Should the contributor pay more and the Exchequer less? Should all benefits be freely given to everyone? Should some be reserved for those who need them most?

It is in their attitude to this last question that the Government and the Opposition differ most sharply. The Government believe that our limited resources should be concentrated where the need is greatest. Let us, they say, discontinue or diminish indiscriminate benefits, such as subsidies on bread, milk, and school meals, so that we may offer more help to the widow, the sick, and the aged; to guard against extravagance, let us put charges on prescriptions; to give priority to children and expectant mothers let us make some charge for dental treatment. The Opposition reply that a benefit may too easily become a charity when it is in fact available only to the less fortunate. A charge, like a subsidy, they point out, falls indiscriminately and clumsily on everyone. Those on whom it falls too heavily, say the Government, may reclaim their money from the National Assistance Board. For many, reply the Opposition, this procedure is too complex, for many humiliating.

On the other hand members of both parties were prepared to accept it as reasonable that the many who are at work should contribute substantially to the social services. The latest increase is earmarked for the National Health Service, and it was suggested that this arrangement might in hard times prove a valuable shelter from Treasury economies. But it would be dangerous if the Exchequer contribution came to be regarded as a constant, and expansion, and indeed maintenance, of the services came to depend on rising contributions. The weekly stamp is a blunt tool. So long as every man pays the same, it is inevitably tied to the amount that the lowest wage-group can afford, and several Labour members suggested that a system of graded contributions might be worth considering.

Lord Hailsham, among others, has lately said that the design of our social services is distorted because it was planned to mitigate the hardships of the past rather than to meet the difficulties of the present. Certainly inflation today is a more urgent threat than unemployment. The cost of the Welfare State is higher than we expected and the taxpayer is hard-pressed. But the nation's future depends on the education, health, and security of its citizens, and they in turn will probably depend on our finding the right answers to some of these questions.

Dr. SIBYL HORNER has been appointed Senior Medical Inspector of Factories in succession to Dr. E. R. A. Merewether.

Dr. F. C. O. VALENTINE, reader in chemotherapy in the University of London at the London Hospital, died on March 23 at the age of 59.

4. Fergusson, J. D. *Proc. R. Soc. Med.* 1949, **42** 806.

Special Articles

ORGANISATION IN GENERAL PRACTICE

Success of a Shift System

P. M. HIGGINS
M.B. Lond., M.R.C.P.
GENERAL PRACTITIONER, RUGELEY, STAFFS

THE cost of building and the restriction of capital make it essential, in planning a group practice or health centre, to study those designs and methods that allow more work to be handled without proportionately increasing the amount of space required. Improvements in organisation and administration may serve this end so well as to affect considerably the planner's basic conceptions of what is needed.

The traditional routine of general practice has been modified in many places and in various ways; but in most practices, for a large part of the working day—perhaps six hours or more—the surgery premises are unoccupied. Where the surgery is part of the doctor's house this may be of little consequence, but in a group centre such a routine is wasteful of accommodation and staff.

In 1954 our practice was faced with a sudden and unexpected increase of work. As there was no prospect of enlarging our facilities correspondingly, the only solution was to improve organisation so as to make the best use of the existing premises.

Our Patients and Our Surgery

In 1953 the practice consisted of four partners and an assistant. One of the partners was almost wholly engaged in a small community of about 1800 people, while the others looked after about 10,500 patients in Rugeley itself and the surrounding area. In that year a group centre was opened to serve this population. An existing building was adapted to make a waiting-room and office, and a lavatory and three consulting-rooms were built on at the rear.

While this work was under way a National Coal Board estate was constructed in the town. Tenants began to move in during 1954, and by the end of 1955 there were 15,132 patients in the practice—an increase of just over 2800. But the increase in work was out of proportion to the numbers: the new patients were 21% of the total practice, but they accounted for an average of 26% of the new calls (table I), and men from the new estate made 42% of the total male attendances (table II). Though another partner joined us, the practice and its facilities were greatly overburdened. At each surgery the waiting-room was full, the queue often reaching the doors. An hour and a half before the evening surgery started, the waiting-room would begin to fill, and by 5.30 P.M. there might be 50 or more people waiting. During 1955 there were 43,253 attendances at the surgery; on a Monday evening 130 or 140 patients might attend.

To deal with this situation separate clinics for children and expectant mothers were held during the afternoons and an appointments system was started. Similar arrangements have been successful in other practices, and they helped us too. But the root of this problem was how to enable more than three doctors to work at each surgery session. The simplest solution—to build one or two extra consulting-rooms—had two disadvantages: (1) the considerable capital cost, and (2) the administrative awkwardness of enlarging, in a linear fashion, the existing building. The alternative solution—to work a shift system—would not have these disadvantages and would, moreover, spread, instead of concentrating, the work-load. As we could not get permission to extend the premises, the first solution was in any case impossible, and we started a shift system on Nov. 1, 1955.

Surgery Hours

The final plan was that in the mornings—except on Wednesday and Thursday which were off-duty days for some—two doctors would see patients from 8.30 to 10.30 A.M. and would then give way to two others who would work until 12.30 P.M. These four would see patients by appointment only, and, as it was then thought essential to make provision for casual attenders, without allowing them to destroy the appointment system, a fifth doctor was to be available from 9 to 11 A.M. to see such patients. In actual fact, eventually all doctors saw patients by

TABLE I—NEW CALLS, COUNTED EVERY FOUR WEEKS DURING 1955

Week ending	Total	New estate	% new estate
Jan. 8	171	45	26·3
Feb. 5	196	49	25·0
March 5	156	43	27·6
April 2	149	32	21·4
April 30	138	37	26·8
May 28	178	35	19·6
June 25	159	63	39·6
July 23	206	53	25·7
Aug. 20	136	32	23·5
Sept. 17	155	49	31·6
Oct. 15	176	33	18·7
Nov. 12	170	55	32·3
Dec. 10	192	50	26·0

appointment; casuals were fitted in as necessary and proved much less of a problem than was feared.

On Monday evening six doctors were accommodated in the three consulting-rooms—three from 4.30 to 6 P.M. and three from 6 to 8 P.M.; $10^1/_2$ surgery hours were thus available and 120 to 130 patients could be seen without strain. On Tuesday evening five doctors worked similar shifts.

The surgery premises were then in use during the following times:

Monday	Tuesday
Surgery 8.30 A.M.–12.30 P.M.	Surgery 8.30 A.M.–12.30 P.M.
Children's clinic 2–3.30 P.M.	Antenatal 2–4.30 P.M.
Surgery 4.30–8 P.M.	Surgery 4.30–8 P.M.
Wednesday	**Thursday**
Surgery 9–11.30 A.M.	Surgery 9–11.30 A.M.
Antenatal 2.30–5 P.M.	Surgery 5–7.30 P.M.
No evening surgery.	
Friday	**Saturday**
Surgery 8.30 A.M.–12.30 P.M.	Surgery 8.30 A.M.–12.30 P.M.
Antenatal / Children's clinic 2–3.30 P.M.	No evening surgery.
Surgery 5–7.30 P.M.	

Thus on most working days the centre was being fully used from 8.30 A.M. to 7.30 P.M. or later. During 1956

TABLE II—SURGERY ATTENDANCES OVER THE PERIOD DEC. 5–31, 1955 (COUNTED FOR 32 OUT OF A TOTAL OF 40 SESSIONS)

Total attendances	Total male attendances	New estate male attendances	% new estate
2773	1583	666	42

seven doctors, including a trainee assistant, were fitted into this scheme, using only three consulting-rooms.

Staff

Under our old régime we employed two receptionists, who had some help from the dispenser from the branch surgery. Now we have an extra receptionist to work half-time, but this addition has not been made solely because of extra work: the dispenser has been freed from some of her duties in the main centre and the working hours of the staff have been organised into a more reasonable pattern. The work has of course increased; in particular the number of telephone calls has gone up. But the work is now better spaced; cards for most patients can be looked out before the surgery begins and the flow of patients is spread over a longer period. The staff are now, however, almost wholly concerned with the reception and organisation of patients and have little time for other duties.

Results

An immediate lightening of the strain and the burden of work was noticed by all the doctors, and it was at first put down to the season. Not until the end of the month were the figures produced, which showed that, in fact, in the first three weeks of November, the attendance-rate had been the highest for the whole year.

It is also worth relating the figures to the social classes in the practice population (table III). The main industry in the district is coal-mining, but there are some light industries in the town, mainly employing women. The practice also serves the agricultural area around the town. The occupation groups were derived from the 1951 census; the exact number of working males in the new population is unknown but it must be over 700, falling almost wholly into social classes III and IV.

To assess the success of the appointment system, a count was made of the number of appointments:

(1) By 3 P.M. for the evening surgery at 4.30 or 5 P.M.
(2) By the end of the evening surgery, for the next morning.

These criteria were fixed in order to rule out any possibility of the numbers containing any casuals turning up early to "queue"; but, needless to say, these are minimum figures. By no means all the patients whose appointments were booked later than these times were

TABLE III—SOCIAL CLASSIFICATION, RUGELEY AND STAFFORDSHIRE

—		Rugeley urban district	Administrative county (Staffordshire)
Total males (occupied and retired) aged 15 and over..		3144	310,356
Social class ..	I	59	6040
	II	298	38,927
	III	1711	168,562
	IV	726	56,837
	V	350	39,990
Proportions per 1000 total	I	19	19
	II	95	125
	III	544	544
	IV	231	183
	V	111	129

casual callers who had to wait their turn. Particularly is this true of the morning surgery, because many more appointments for it would be made over the telephone before the surgery began. That few were casuals is shown by the numbers in the waiting-room at the beginning of each surgery. From July to September there was an average of 62% appointments. Later weekly percentages were:

Week commencing Oct. 22—69% (total attendances 917)
" " Oct. 29—72% (" " 855)
" " Nov. 12—73% (" " 855)

(The figures for the last two weeks are not complete, relating to seven out of ten sessions in the week commencing Oct. 29 and eight out of ten in the week commencing Nov. 12.) Table IV gives detailed figures for the week with the largest number of surgery attendances (937)—i.e., that commencing Nov. 5.

TABLE IV—APPOINTMENTS FOR THE WEEK BEGINNING NOV. 5, 1956

—	—	Attendances	Appointments	
			No.	%
Mon.	Morning	98	40	40
	Evening	116	111	95
Tues.	Morning	89	59	66
	Evening	92	81	88
Wed.	Morning	94	53	56
Thurs.	Morning	89	56	62
	Evening	113	105	92
Fri.	Morning	103	80	77
	Evening	52	38	73
Sat.	Morning	91	54	59

It is interesting to note that the evening surgeries appear to be much more fully booked, and over the four weeks Oct. 22 to Nov. 19 the percentage never fell below 74% and once was as high as 95%. The lower figures (ranging from 40% to 84%) for the morning surgeries may be due in part to the limiting effect of the criteria adopted; the true figure is almost certainly higher than this.

These figures show the extent to which patients made use of the system; we come now to examine its effectiveness in practice. The method chosen was to have the number of patients waiting counted every half-hour. Owing to staff changes and pressure of work these figures were collected for only fourteen sessions, between Dec. 5, 1955, and Feb. 24, 1956. The maximum number waiting varied between 6 and 26, with an average of 11—except for one unusual occasion when it rose to 33 because one partner had fallen ill and another had been delayed half an hour in starting his surgery. When it is recognised that up to 140 patients were seen at one session, it will be seen how effectively the system worked. Moreover, the numbers waiting have to be broken down in three ways:

(1) They are waiting to see three doctors.
(2) Some are accompanying patients.
(3) Some are early for their appointments.

The effect of these last two factors became clear one evening when all three doctors were working to schedule, yet the waiting-room contained 12 people.

The maximum number waiting was almost always at its greatest at the time when the shifts changed and we are now trying to diminish the effect of this by allowing a gap of 15 minutes at this time. Experience has shown the way to other improvements. The general rule is that 3 patients are booked every quarter of an hour, but allowance is now made for the individual doctor's rate of work. A profitable study could be made of the consulting-time needed by different groups: for example there is an impression that, on the whole, women patients need more

TABLE V—NUMBERS WAITING; FOR WEEKS COMMENCING OCT. 22 AND NOV. 5 1956

Date	Day	Total attending		Time														
		A.M.	P.M.	8.30	9.0	9.30	10.0	10.30	11.0	11.30	12.0	4.30	5.0	5.30	6.0	6.30	7.0	7.30	8.0
Oct. 22	Mon.	89	125	2	10	12	6	15	5	0	0	6	7	8	9	12	9	0	0
	Tues.	96	116	1	4	13	12	14	8	1	0	8	4	9	12	15	3	0	..
	Wed.	77	..	0	0	8	6	12	14	3	0	..	..	..	..	..	..	..	..
	Thurs.	70	98	0	3	0	6	6	0	0	0	4	6	7	4	5	2	0	0
	Fri.	84	73	0	3	7	8	..	2	0	0	0	4	12	16	14	4	..	..
	Sat.	89	..	3	4	6	10	7	2	0	0	..	..	..	..	..	..	..	..
Nov. 5	Mon.	98	116	6	5	10	14	14	..	..	..	10	13	6	14	17	14	..	..
	Tues.	89	92	Not counted								4	2	1	2	14	15	5	..
	Wed.	94	..	1	4	7	10	17	18	7	..	..	..	..	..	..	..	..	..
	Thurs.	89	113	2	10	2	16	19	9	4	..	3	3	10	9	16	7	..	..
	Fri.	103	52	0	0	15	17	15	9	..	..	2	15	7	0	0	0	..	..
	Sat.	91	..	0	5	9	7	0	0	..	..	..	..	..	..	..	..	..	..

time than men and might therefore, with advantage, be given appointments towards the end of the surgery.

More complete figures for the weeks commencing Oct. 22 and Nov. 5 are given in table v. They relate to a period when, as will be mentioned, a fourth consulting-room was in use; the figures of patients waiting must therefore be divided by four, and not by three.

The main factor in this improvement has been the appointments system. The chief effect of the shift system has been to spread the load. Up to 30 patients are seen before the time when surgeries used to start (at about 9.30 A.M. and 5.30 P.M.), and this has diminished the bulge in the waiting-room.

The most significant evidence of improvement has been that we have now been able to reduce the size of our waiting-room so that it now accommodates about 20, instead of 60, patients. Not only does this make it a more attractive place, and lessen the risk of cross-infection, but the space saved has been used to provide a new and more efficiently designed office. The former office has been converted into a double-purpose room which can be used either as a surgery or for dispensing and office procedures. It has in fact been used as a fourth consulting-room with an adjustment of our shift system.

No claim is made that the above represents an ideal arrangement; what has been done has been done under the pressure of events and in the face of severe limitations. Further developments wait on better days and more spacious surroundings. Until they come, purely administrative changes have enabled this practice to increase its facilities, to deal with an extra 2800 patients, and so to improve its organisation as to serve adequately a population of over 13,000 from a centre occupying approximately 1100 sq. ft.

I wish to express my thanks to the staff of the centre for their help in collecting the figures set out in this paper, to Dr. Gerald Ramage, county medical officer of health, for providing the information in table III, and to Mr. S. Clewes, clerk to the Staffordshire executive council, for figures on the practice population.

The members of the partnership are Dr. B. A. Abbott, Dr. P. M. James, Dr. Stanley Dillon, Dr. P. J. MacMonagle, and myself.

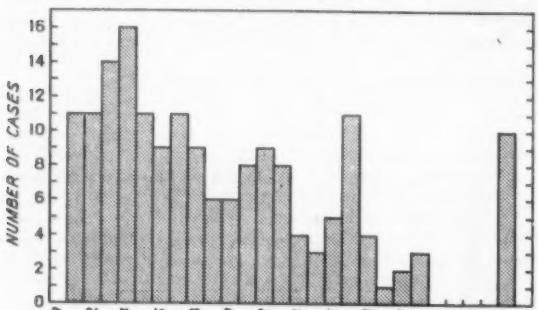
Public Health

"OPHTHALMIA NEONATORUM" AND MINOR NEONATAL INFECTION

I. GORDON
M.D. Edin., M.R.C.P., D.P.H.
MEDICAL OFFICER OF HEALTH, ILFORD

IN Ilford, as the accompanying figure shows, notifications of ophthalmia neonatorum were steadily falling, until there were none in the four years 1952–55. In 1956, however, there were 10 (see figure). The disease notified is not classical opthhalmia neonatorum. When the notification was received, each case was visited by a member of the public-health department, and by that time the condition had practically subsided. No doubt many would have diagnosed the cases as "sticky eye"; but why did the Ilford practitioners notify these 10 cases in 1956, and none in the previous four years, when undoubtedly they must have seen many cases of sticky eye? Presumably in 1956 they were stickier than usual.

The 10 cases were notified by six different doctors; none notified more than 2. 5 of the infants were born at home in different parts of the town, and 5 in hospital—four different hospitals, scattered over Greater London. In 2 of the home confinements there was the same midwife; in the 3 others different midwives. Hence there is no question of a local epidemic or individual reporting idiosyncrasies. No publicity of any nature had been directed to this condition or its notification in the past few years locally.



Cases of ophthalmia neonatorum notified each year in Ilford.

I suspect that what is being notified is probably a mild staphylococcal infection. Nearly all the extensive literature on antibiotic-resistant staphylococci refers to hospital practice; and half of these infants were delivered at home. But, in resuming work in an infant-welfare centre after some six years' absence, I have been impressed by the present extent of minor sepsis in the newborn—"sticky eye," mastitis (infective, not secretory), paronychia, blisters in the flexures, and discharging navels; and I get the impression that such sepsis is becoming as important as impetigo was in school-children before the war.

In New Zealand staphylococcal infection of the newborn and pemphigus neonatorum are now notifiable diseases,[1] presumably because New Zealanders are worried as to its prevalence. May this have any relation to the system of paying practitioners according to the number of items of service they provide, which must encourage the use of antibiotics?

The national figures do not, so far, reflect any rise in the notifications of ophthalmia neonatorum. It will be interesting to see whether the Ilford figures are an indication of the shape of things to come.

Immunisation against Diphtheria

Observations in Heston and Isleworth have led Anderson[2] to conclude that in immunisation against diphtheria booster doses of antigen provide no significant advantage over primary immunisation only. In a review of children born in 1941, 1944, and 1947, he found that of all who had undergone primary immunisation and had later received a booster dose 91·4% were Schick-negative; whereas of all who had undergone primary immunisation only 89·9% were Schick-negative. This difference being very small, Anderson concludes that, so long as the incidence of diphtheria remains low, reinforcing inoculations should not be undertaken.

Population of England and Wales

The Registrar-General[3] reports that projections of the population of England and Wales show that, on certain stated assumptions, the total population will increase from 44,821,000 (as at mid-1956) to 45,569,000 in 1961, 47,423,000 in 1976, and 48,545,000 in 1996. In 1956 live births registered exceeded deaths by 177,657. The corresponding increase for 1955 was 146,090, and the average increase for the five years 1950–54 was 167,349.

1. *Med. Offr*, 1957, **97**, 16.
2. Anderson, A. *Ibid.*, March 22, 1957, p. 161.
3. Registrar-General's quarterly return no. 432, H.M. Stationery Office. Pp. 32. 1*s*. 6*d*.

In England Now

A Running Commentary by Peripatetic Correspondents

FEELING is running high among children throughout the country that so far there has been no reply to their plea that they should have an immediate rise to 1*s.* for each extracted tooth. A representative of the children said in London yesterday: "There has been no increase in the agreed 6*d.* bonus over the past thirty years. During that time the price of cinema seats has doubled, bars of chocolate cost three times as much, and the advent of the new atomic weapons and Davy Crocket hats is placing enormous strains on our resources." The President of the Dental Practitioners' Union has said that dentists are unanimously opposed to a rise and that no interference from the State will be tolerated. "Let us fight it out with the children," he said, "it is the only way to justice." Ministers are known to be deeply concerned that the situation should not worsen as there is clearly a risk that children will soon demand further rises in pocket-money, thus increasing the general inflationary effect on the economy. "Let us arbitrate now—it will have to come to arbitration in the end," said the Minister of Paradontics last night. He is confident that the Commission on Dental Awards will be able to produce a just solution for all.

* * *

My dentist works at St. Cecil's-in-the-South, across the way from our place; and, as we were students together in the high-and-far-off-times, my treatment is erratic to say the least. When Conferences bow me down, it is too easy to mutter that old Bell won't mind, and send a message across. In the same way he knows that to cancel my appointment won't lead to much heartache and waiting about. Our average day seems to go something like this:

I get a phone message at about 11.50 A.M. saying: "Mr. Bell rang but you were with the Professor and he says he's very sorry he won't be able to make your 12 o'clock appointment today but would you ring him back?" I ring back, and after a search they say: "We're very sorry, but Mr. Bell has just left and we don't know where he went. Please may he ring you back?" I leave a clear account of my expected movements with both telephonists and tell them to flash my lights as well, but in the middle of the afternoon I absentmindedly settle in the one part of the outpatient department where the 3-per-second flash does not penetrate. "Oh, *there* you are doctor, they've been ringing everywhere; there's a call for you from St. Cecil's." The slightly hysterical telephonist says he couldn't wait any longer but would I ring back shortly. By then Bell has been called to an unexpectedly fractured jaw, and is even now at the table. I ask him to ring me back, and go home. "Hallo, old chap," he says that evening over the phone: "There you are at last, what was it you wanted?" "I don't want anything thanks, what did you want?" "Don't be silly," he says: "You asked me to ring you back," "I know," I reply, "But you asked me to." "But you asked me to ask you to ask me to ring you back first!" he claims triumphantly. "Nonsense, *you* started all this." I am emphatic on this point. "Do you know, I do believe you're right now I come to think of it," he apologises. "O.K., but what the hell do you want?" "Do you know, I'm not sure now." He is helpless with mirth: "I believe it was to say I was sorry I couldn't make your appointment; yes it was. Well, do come over to lunch tomorrow."

"Thank you," I reply: "I'll ring you back."

* * *

Our hospital is a postgraduate teaching institution and it attracts a number of American nurses who pause there in their intensive global tour. Our Senior Night Sister, seeing one of them on duty for the first time, remarked brightly, "Good evening, Nurse," to which the other replied "Hi," waving a hand in friendly greeting. It was, accordingly, with some surprise that a recent arrival was observed to be polite and aloof to the point of coldness, adding a respectful "Sirr" to each sentence. Poor girl, we thought, she must have heard so much about the polite and formal British; and we gave her time to settle in. At last my patience broke. I had known her for some weeks, and one quiet evening I said: "Please, Nurse, stop calling me Sir." She looked at me through those acutely angulated lenses and growled unexpectedly and quite without malice: "O.K. you lousy bum."

* * *

It was late and it was raining. Bright shop lights added to the confusion of sodium street-lamps, zebra-crossing beacons, traffic signals, keep-left signs, and all the other means of keeping the motorists' eyes off the road. A little green Ford dragged itself reluctantly past the red light and shook bumpers with a big black one. There this not unfriendly encounter might have ended, but for the long arm of the law.

The hall of the stipendiary magistrate's court was crowded when, two months later, my solicitor looked gloomily at the notice-board and said: "Yours is the last case of the day. You won't get away before six. Consider yourself lucky it's such a trivial affair. If all goes well you might come off quite lightly. Of course, you'll be fined, you know. They all went up this year, so don't expect less than five guineas. There will be costs on the top of that, they are often quite a tidy bit. Of course, that's only for the first charge. You'll probably get the same again for careless driving. Let's hope they don't get you for dangerous driving—you could lose your licence for that. Do you have to use your car in your work? Never mind, this should be quite a simple case. Why don't you go inside and hear some of the other cases to take your mind off it?"

The first case was that of a young lady who had walked up and down the Strand a few times. She was fined 40*s.* The apologetic gentleman who next stood in the dock had failed to pay his taxes on time. "Have you paid them yet?" the magistrate asked him. Apparently he had. "Then you must pay a fine of 10 guineas," said the magistrate. The third prisoner was charged with stealing 6*d.* It was not his first offence. "What have you to say?" he was asked, to which he replied that he was very sorry and would take advantage of the earliest possible opportunity to repay the stolen sum. "In that case, you shall be given your chance," he was told, "but you must first go to prison for five months."

I can't think why more people don't go into the legal profession. Hearing cases at a magistrate's court seems to be rather like taking a G.P. surgery, except that you need think only half as hard, you get through the list twice as fast, and you are immune from litigation. But I can hardly be said to speak entirely without bias.

* * *

Last week I had to attend an important interview for a post in pædiatrics. The prospect did not unduly worry me, though I was promised a gruelling hour's interview. The night before the great event, however, I went through the interview in my dreams, and to my surprise it was so thorough that it included the examination of my tonsils. One of them was said by the chairman of the board to be infected, and somebody else got the job.

* * *

Why do doctors put strings of strange letters after their names? What use are L.M.S.S.A., M.R.C.P., or D.P.M. in helping a patient to find the type of doctor he wants? Why not initials to give a clue to the doctor's professional personality—e.g., V.S. (very sympathetic), J.H. (jocular and hearty), or G.G.E. (gives good examination).

* * *

The pioneers of America might be less surprised than is commonly supposed if they returned today. The spiritual descendants of Billy the Kid, for instance, now show their killings by notches on the bumpers, are more often arrested by the sheriff, and are convicted in terms of blood-alcohol estimation and an inspection of brake-linings. Methods of making tea devised at the Boston Tea Party are still in use to judge by the result. Indian war-cries are still to be heard by tuning the radio to almost any station. The standard crew cut of the American male shows only too well that the technique of scalping is not a lost art.

Letters to the Editor

FŒTAL AND NEONATAL ANOXIA

SIR,—While agreeing with almost all you say in your leader of March 16, I am unable to see the logic of your statement that the fact of infants being able to survive long periods of asphyxia without damage to the nervous system is "an encouragement to those who plead for more active resuscitation of the newborn." Presumably "more active" refers to positive-pressure oxygen. We can all agree that if there is evidence of obstruction which cannot be relieved by posturing and nasopharyngeal suction, it is logical to pass a tracheal tube under direct vision and apply controlled suction. But these cases do not require artificial respiration; the baby is capable of breathing, but breathing is obstructed. The cases which are controversial are those in which intranatal factors (prolonged labour, low hæmoglobin in the mother, hæmorrhage, anæsthetics, analgesics, &c.) have caused anoxic injury to the midbrain with failure of respiratory activity. The baby is suffering from "white asphyxia." It is limp, pale, or cyanosed, and makes no respiratory effort. In such cases it is doubtful whether the lungs can be made to expand and take up oxygen by positive pressures which do not also rupture the lung. I have seen one case recently with bilateral pneumothorax following positive-pressure oxygen; this infant did not survive.

No doubt this problem of the anoxic infant will become less urgent as all possible measures are taken to secure physiological parturition, but we are very far from this position at present and in the meantime it astonishes me that there is not universal acceptance of the value of intragastric oxygen. Here is a method which is safe, which is available to any midwife if she is given the necessary equipment, and which secures oxygenation of the blood (enough to abolish clinical cyanosis) in perhaps 3 out of 4 such cases. It is a reasonable assumption that this degree of oxygenation will prevent further cerebral damage and put the infant in the best position for spontaneous recovery of respiratory function. Some experienced operators consider that there are times when intragastric oxygen fails to produce, or perhaps to maintain, a good colour in the baby, and when intubation will allow *bronchial* absorption of oxygen enough to save life; for this, relatively low pressures of oxygen are required. This may well be the case, but laryngoscopy and intubation can be carried out only by someone medically qualified, with the necessary training and equipment. More than three-quarters of all deliveries are by midwives alone.

Farnborough Hospital, Kent. D. G. LEYS.

BRONCHIAL CARCINOMA

SIR,—We deplore the complacency of recent letters and wish to support Mr. Vernon Thompson's plea (Feb. 23) for a greater sense of urgency in the diagnosis of bronchial carcinoma and a greater awareness of its possibility in any doubtful respiratory illness. Too often procrastination in actively making a diagnosis removes the chance of successful surgery. Experience in Birmingham of 4103 cases recently reviewed [1] has shown that a successful excision of the growth by pneumonectomy or lobectomy offers a 21% chance of surviving five years, but only 12·2% had a resection. This deplorably low figure was largely due to the fact that 63% of cases had inoperable growths or metastases when first seen at hospital. Up to some point in their history, all growths must be essentially resectable. Hence early recognition is vitally necessary.

Most cases come to be examined on account of symptoms. In 10% their first symptom has been of an inoperable nature (neurological, metastasis, swelling of the neck, &c.). The others demand an X-ray of the chest, since most (73%) are referable to the lungs. That is where the "wait and see" policy, the "review in 6 weeks," the "unresolved pneumonia," and other futile reports spell death to the patient. In a disease so common and with such prominence in the mind these days, it is extraordinary to us how reluctant radiologists and physicians are to consider the possibility of cancer. There is no time to be lost—analysis of 1592 cases in 1950 [2] showed in untreated cases an average time from first symptom to diagnosis of 4·4 months and of life after diagnosis of 4·0 months. Surgeons can hardly expect to cure their patients if they arrive only in the last stage of their illness.

Edgbaston, Birmingham, 15. A. L. D'ABREU
A. BRIAN[s] TAYLOR.

HOSPITAL MEDICAL RECORDS

SIR,—I wish to refer to a problem of some urgency regarding the fate of medical records in National Health Service hospitals.

Hospital medical staffs of the National Health Service have recently been, or are likely soon to be, asked by their management committees to advise them on the question of keeping or destroying medical records. This advice should be given with circumspection.

Medical records—i.e., case-papers, reports, X rays, &c.—are, like other hospital records, Public Records, within the meaning of the Public Records Office Acts. This means that their preservation or destruction is subject to legal limitations and not to local or individual caprice. In 1954 the Ministry of Health issued a circular (H.M.54/47) to management committees informing them that at that time no records could be destroyed until definite permissive regulations had been issued. These regulations issued by the Ministry of Health with the Public Records Office appeared in December, 1956 (H.M.56/103), comprising a circular and a schedule of a list and particulars of certain classes of documents accruing in hospitals and offices of hospital authorities not considered of sufficient public value to justify their preservation in the Public Records Office. This deals with all manner of medical and hospital records, many not of medical character.

Under the terms of this last circular and the accompanying schedule, it is now permissible for management committees to destroy medical records of patients six years after their last attendance at the hospital in question except in the case of mental hospitals. In the case of patients who died, the notes may be destroyed three years after their death. Both circulars explain that this legislation is permissive and suggest that the records should in fact be kept for the longest possible time. This point deserves great emphasis.

The period of six years that is employed is probably inspired by legal considerations and from the medical viewpoint seems very short. This is obviously so in relation to the life time of a child patient, or in respect of a disease liable to recurrence—for example, rheumatic fever. It is also short in respect of a disease like disseminated sclerosis, which has a long extension in time.

Aside from the welfare of the individual patient, however, a considerable amount of genetic, statistical, and large-scale social medical research must involve consulting records extending over a longer time than this. Moreover, it is at least a tenable proposition that patients are entitled not to have their records destroyed at all. Almost certainly they have no such right at present, but whether they should not have one is worth considera-

1. United Birmingham Hospitals Annual Cancer Report, 1954, vol. 2.

2. Taylor, A. B., Waterhouse, J. A. H. *Thorax*, 1950, **5**, 257.

tion. The provision of a medical dossier for all patients might be a proper and valuable feature of the National Health Service. Perhaps a National Medical Archive Office storing microfilm copies of records is not an impracticable suggestion.

Meanwhile, the practical problem of keeping patients' records revolves around the question of the space required for their storage. The ideal way of keeping records is probably in their original and complete form. Less satisfactory is to employ some selection of types of records to be conserved. Microfilm records obviously save an enormous amount of space, but the initial cost of the apparatus, as well as the continual employment of extra staff to operate it, represents a formidable financial burden, and such a solution might be more suitable to a Central Medical Archive Office than to smaller units such as hospital groups.

In my view, it is better that case-papers be kept intact and indefinitely and in their original form until some further consideration be given to this problem on a national scale. It seems unsatisfactory that the fate of patients' records should be decided at the level of local hospital management committees whose practice will certainly vary.

Lewisham Hospital, London, S.E.13. M. O. SKELTON.

INSULIN TREATMENT OF SCHIZOPHRENIA

SIR,—I should like to congratulate Dr. Ackner, Dr. Harris, and Dr. Oldham on their controlled study, a masterpiece of planning and execution, described in your last issue (p. 607). Whether we like it or not, we shall have to accept their conclusion that insulin is not the therapeutic agent of the coma régime. However, this need not sadden the old hands; it simply confirms that for getting there in medicine there is nothing like the prescription: Sweat makes good mortar.

Isleworth, Middlesex. H. PULLAR-STRECKER.

HEBERDEN SOCIETY

SIR,—Your report of March 16 (p. 565) of the papers read at the meeting of the Heberden Society on Feb. 22 contains a number of inaccuracies which we would be grateful if you would correct.

First, with regard to the electrodiagnostic changes in polymyositis, no evidence of spontaneous lower-motor-neurone activity was found and it was the association of a high rheobase with an intensity-duration curve characteristic of denervated muscle that was of significance. The characteristic electromyographic change was a predominance on volition of the short duration and polyphasic motor unit potentials typical of a myopathy with, in half the cases, the coexisting features of a neuropathic lesion—i.e., long duration polyphasic motor unit potentials with occasional fibrillation potentials and positive potentials.

Second, the paper on the electrophoresis of serum-proteins referred not, as you report, to "glycoproteins," but to "mucoproteins," the fractions M_1 and M_2 of which form a part only of the α_1 and α_2 glycoproteins respectively. Therefore, mucoprotein M_1 or M_2 should be read for α_1 or α_2 glycoproteins throughout your report. While the spot shapes indicative of fraction micro-heterogeneity were obtained after two dimensional electrophoresis, semi-quantitative estimation of the two mucoprotein fractions were, in fact, based on a single electrophoretic analysis at pH 4·5.

Finally, in the paper on sheep-cell agglutination tests, the figures you report—e.g., positive results in 48% of cases of lupus erythematosus—relate to those quoted from the world literature and were not the results obtained at this hospital upon which the paper was based. More important, however, is the fact that not all of our lupus cases with positive agglutination with the supernatant had a positive result with the precipitate and as a method of distinguishing between rheumatoid arthritis and lupus erythematosus, it was apparently reliable in the event of a positive agglutination with the supernatant. Finally, it was the cases of systemic lupus erythematosus without joint involvement that appeared to have a higher incidence of false positive Wassermann tests (especially the cardiolipin test) and it was in two cases, not one, of systemic lupus with positive agglutination tests that the activity lay in the β-globulin zone.

Department of Physical Medicine and Rheumatology, Royal Free Hospital, London, W.C.1.
A. T. RICHARDSON
J. H. JACOBS
R. L. MARKHAM
E. V. HESS.

CIGARETTE SMOKING AT SCHOOL

SIR,—I was most interested in the article by Dr. Parry Jones in your issue of March 23. I notice that he thinks his results might be abnormally high.

I am at present conducting an investigation into the smoking habits of school-children in this county. This is being carried out by means of an anonymous questionnaire, following an explanatory talk to the pupils. The eventual total number involved will be in the region of 9500 children between the ages of 11 and 16 and attending all types of school. Several months will elapse before the survey has been completed and analysed, but preliminary results indicate that Dr. Parry Jones's findings are not in any way abnormal, and, in fact, some of my earlier findings show that the incidence of smoking is higher than he has quoted.

Health Department, Oxfordshire County Council, Oxford. P. W. BOTHWELL
Deputy County Medical Officer.

RHEUMATOID ARTHRITIS WITH CHRONIC LEG ULCERATION

SIR,—It was not at all our intention, in our article of Feb. 9, to suggest that varicose ulceration may not coexist with rheumatoid arthritis. It would indeed be significant if two such common disorders were not often seen in the same patient. We are naturally familiar with cases like the one Dr. Rivlin mentions (March 9) in which, as he says, the ulcer obviously results from venous stasis.

Our point is that in the cases we described we could decide that the ulcers did not so originate. We need hardly detail the bed rest and ancillary treatment we gave for these ulcers except to emphasise that the methods we used were those by which we regularly heal stasis ulcers and that failure of these cases to heal was striking and at first unexpected.

We agree with Dr. Laine and Dr. Vainio (March 23) that the L.E.-cell phenomenon is not specific, but we had more evidence than this. Because of the clinical similarity of the cases, all showing skin ulceration with rheumatoid arthritis in the absence of vascular stasis, we thought it right to group them together, and it then is seen that among six patients four had shown drug sensitivity, all had serum abnormalities, four showed the L.E.-cell phenomenon, and there were many other features which taken together can all be covered by the diagnosis of disseminated lupus erythematosus and by no other single diagnosis.

In describing these cases as "rheumatoid arthritis with chronic leg ulceration" we were careful to avoid calling them "disseminated lupus erythematosus with leg ulceration," and in our discussion we indicated the contrast between these cases and the more acute case in which the diagnosis of disseminated lupus erythematosus is more acceptable.

In general the diagnostic criteria of disseminated lupus erythematosus cannot be precisely laid down. If, therefore, we put these cases into the category of disseminated

lupus erythematosus, it is only tentatively and with the realisation that further study may show this to be unsound. Our chief purpose has been to indicate the need for further study.

J. H. ALLISON
F. RAY BETTLEY.

London, W.1.

A NEW CLINICAL ENTITY?

SIR,—Since the beginning of this year, I have seen more than 60 patients suffering from an infectious disease which has become epidemic. It seems to fall into the category of benign myalgic encephalomyelitis, group II,[1] as seen at the Royal Free Hospital in 1955.

In all cases there have been fever, generalised muscular aching, severe headache, and glandular enlargement. In many these have been the only findings though the glands of the posterior triangle are most prominent, the occipital group is spared, thus distinguishing the illness from rubella and mononucleosis. The Paul-Bunnell test has been negative and the leucocyte-count normal in those cases tested.

Most patients present with respiratory-tract symptoms, unusual for this time of the year; and painful pharyngitis is common. Aspiration pneumonia has occurred in a few.

Serious complications are rare, but hepatitis, polyarthritis, and skin rashes have been observed.

A recent development has been a recurrence of high fever during the apparent recovery stage.

In all of the severe cases there is extreme weakness during the attack, sometimes with disproportionate depression. It seems probable that a period of post-infective debility extending over several weeks, may result in these patients.

It has not been possible in a general practice to embark on laboratory investigation in all cases, but from the clinical standpoint, this is probably another outbreak of "a new clinical entity."

Brighton,
South Australia. DENE A. HICKS.

ÆTIOLOGY OF PRE-ECLAMPSIA

SIR,—Professor Franklin,[2] speaking on behalf of himself, Mr. Sophian, and others, postulated that "toxæmia of pregnancy is, or includes, a progressively increasing tendency for the renal shunt to be brought into operation, and that fatal bilateral cortical necrosis is the maximal, irreversible result of this tendency." Mr. Sophian, in his letter of March 16, has again claimed that the "primigravid uterus by resisting stretch imposes renal ischæmia, and that this change is responsible for the pre-eclamptic syndrome."

Bilateral renal cortical necrosis is a very rare condition and there has only been 1 death from it in Bradford during the past ten years, during which there have been over 50,000 confinements. It is almost invariably associated with toxæmic accidental hæmorrhage, and the most serious cases tend to occur at about the 30th week of pregnancy, and in multigravidæ. Further, 20% of all cases of eclampsia occur in multigravidæ and 33% of cases of eclampsia occur before the 32nd week. Pre-eclampsia occurs frequently in multigravidæ and before the 34th week, and hydramnios in a single pregnancy is practically never associated with eclampsia. These clinical facts do not support Mr. Sophian's contention any more than do the findings of Dr. Morris which were reported at the same meeting.

The point I wish to stress, however, is that bilateral renal cortical necrosis occurs in infants and in non-pregnant women as well as in pregnant women, and does not cause the pre-eclamptic syndrome.[3 4] The patient with this condition, who is doomed to die within a few days, may have a normal blood-pressure and manifest no œdema. She suffers initially from neither coma nor convulsions. Conversely, some eclamptic patients secrete urine freely throughout the attack.

At the same meeting I claimed that from 10 to 15% of all women were incapable of adjusting themselves adequately to the pregnancy-lactation syndrome because of inherent defects, such as chronic nephritis, hypertension (whether revealed or latent), diabetes, and hypoplasia of the arterial tree, of the endocrine system, or of the genital organs. Adequate antenatal care, which involves weekly visits after the 24th week, can all but eliminate eclampsia and severe pre-eclampsia, cut down the incidence of proteinuria, and delay serious symptoms until about the 36th week, when the infant is viable, but cannot decrease the incidence of hypertension.

The nutritional-mechanical hypothesis thus postulates that serious disturbance of *la fixité du milieu intérieur* is prone to occur in "defective" women as a result of their efforts to adjust themselves to pregnancy, and can only be prevented by adequate nutrition, rest in bed, and to a lesser extent by the use of hypotensive drugs.

Bradford. G. W. THEOBALD.

A STUDY OF WAKE

SIR,—Dr. Cruden's "approach to the problems of insomnia" (March 16) calls, I feel, for much criticism. Starting with an inadequate definition of sleep which he takes from an encyclopædia rather than a medical book he speaks of sleep and wake without mentioning "state of consciousness," which is the unifying concept for both phenomena. A standard textbook[1] defines sleep as "a physiological depression of those parts of the brain concerned with consciousness, induced by the appropriate state of the reticulo-hypothalamic system." This definition would, clearly, do also for wake, if the word depression were replaced by "activation." Therefore Dr. Cruden's calling wake "a temporary cessation of sleeping state" is rather nugatory and not exactly a "fundamental reorientation of thought."

Although I would not object to his statement that "We must be awake to study any problem, including that of sleep-wake," I cannot agree with him when he goes on to say that wake is taken for granted. Much and well-known work (by Bremer, Hess, Magoun, and many others) has been done, indicating that the state of consciousness referred to as wake is the result of an activation directed to the cortex and produced by stimuli which are mediated chiefly by the brain-stem reticular system, involving mostly the hypothalamus and the thalamus. It is true, of course, that our present knowledge of the phenomena of consciousness, including sleep, is far from satisfactory, but this should not allow theories to be advanced uncritically.

Next, Dr. Cruden postulates that sleep is *the* basic state of life. Such a postulate, if meant to be philosophical, should be dismissed as far too vague and dogmatic; seen from a strictly medical angle, on the other hand, it is quite incompatible with the accepted views on the attributes and propensities of life and its relationship with consciousness. The main argument which Dr. Cruden produces to prove orthodoxy wrong and support his postulate is "sleep" during the fœtal state and infancy. Yet by calling the fœtal state sleep one is simply driven to unnecessary semantic confusion; because, logically, sleep should then also extend to the state of fertilised ovum!

Obviously, the application of the term sleep in its neurophysiological and psychological sense to the fœtus becomes an absurdity. The fœtus and the newly born are so immature neurologically and psychologically that their inert state can only be interpreted in structural, developmental terms. Increasing maturation that brings about cortical activity (and a differentiated state of

1. See *Lancet*, 1956, i, 789.
2. Franklin, K. J. *Proc. R. Soc. Med.* 1949, **42**, 380, 387.
3. Kellar, R. J., Arnott, W. M. *Edinb. med. J.* 1933, **40**, 101.
4. Theobald, G. W. The Pregnancy Toxæmias. London, 1955; chap. 30.

1. Brain, W. R. Diseases of the Nervous System. London, 1955.

consciousness) is followed also by inhibition. Whether the latter is done by an inherent mechanism or by some chemical products of activity in general (as the earlier "hypnotoxin" theory had it) or by both has not yet been determined. It seems, however, a fact that this inhibition is proportional to, and therefore a physiological requirement of, the amount of activity (not a "basic state of life," as Dr. Cruden claims); while both are changing in duration as the developmental curve of human life takes us from the inertness of infancy to the full activity of adulthood and to the decline of senescence.

Dr. Cruden's other postulate of "wake-maintainers" is no more fortunate, for it is only another name for stimuli—impinging on the central nervous system at a time when the reticular activating system happens to be uninhibited.

I dare say that doctors are aware of the importance of stimuli (physical and mental) in relation to going off to sleep, and treat their cases of insomnia accordingly; so I fail to see how calling these stimuli "wake-maintainers," and claiming that wake is a temporary cessation of sleep, could alter the prospects of the unfortunate sufferers from insomnia.

Reading the conclusion of the article I wondered whether the idea that arousal stimuli are "a threat to well-being" means, according to Dr. Cruden's views, that "well-being" is sleep? This would, indeed, be an interesting point for discussion.

Bethlem Royal Hospital, Beckenham, Kent. G. M. JACOBIDES.

SIR,—In Dr. Cruden's fascinating essay the conclusion is drawn by philosophical argument that "Wake" is the product of a Selye's "alarm reaction."

Approaching the subject from a practical angle, this view was put forward by Dr. Galley and Dr. Rooms as a result of their experiences with 'Viadril.'[1] They suggested that a viadril analogue, waxing under the stress of waking and waning during sleep, may explain the mechanism of the alternating rhythm occurring in the sleep-wake cycle.

The more our experience enlarges with this "bio-anæsthetic" viadril, the more we feel that by its administration we are producing a true sleep state.

London, S.W.3. L. H. LERMAN.

UNMARRIED PARENTHOOD

SIR,—Mr. Mansfield (March 23) does little to solve the problem. In this day when most people are calling for "their rights," the child-to-be-born has only the "vagitus uterinus"—which, were it articulate, is perhaps too late. But it has been aptly stated[2] that every child has a right to be conceived in love, to be born into happiness, and to be nurtured in security. This is the basic teaching which must be given to married and unmarried alike, whether from school, youth club, church, or guidance clinic.

Implicit in it is a condemnation of coition out of marriage, which may lead to unhappiness and insecurity and which is lust and not love. Only within marriage is coition legitimate, not as Mr. Mansfield suggests, more playful and lusty, but in the beauty of holiness. Marriage between man and woman is a symbol of Christ and the Church[3] and anything intensifying that symbolic relationship is a sacred privilege.

Raigmore Hospital, Inverness. WILLIAM HAMILTON.

SIR,—In table VI of my article (Jan. 19) I inadvertently transposed the number of legitimate and of illegitimate births in the group where social class was not stated. Accordingly the last column of table VI should read, from above down: 4, 1614, and 99·75.

The corrected table shows that in nearly two-thirds of illegitimate births no information is available about social class. Where social class is stated, the proportion of illegitimate births would appear to indicate the association to which I drew attention, but little weight can be attached to this since the omission of information may be highly correlated with social class.

Crichton Royal, Dumfries. CYRIL GREENLAND.

ALLOXAN AS A POSSIBLE THERAPEUTIC AGENT FOR PRIMARY CARCINOMA OF THE LIVER

SIR,—Two letters have appeared since the publication of our preliminary note on this subject on Jan. 12.

The remarks and suggestions of Dr. Loxton (Jan. 26) are most stimulating and indicate that he has appreciated fully, and apparently agrees with, our own orientation to the possible mode of action of alloxan. We are not sure whether alloxan exerts its experimentally demonstrated effects in animals solely by virtue of the diabetes which it induces. In fact there is considerable clinical evidence of a greater incidence of cancers in diabetics than in non-diabetic human subjects.[1] In addition, maintained hyperglycæmia failed to develop in all but one of our cases with proven carcinoma, although there was quite strong clinical evidence and suggestive pathological indication that the alloxan injections had had some adjuvant effects on the liver cancers. It therefore seems likely that alloxan may perhaps induce its anti-carcinogenic action by exerting a widespread effect, intracellularly, on carbohydrate metabolism in *all* cells and perhaps especially on tumour cells—the latter believed to be more dependent on glycolysis. It is at present our impression that the action of alloxan is transient; hence our recourse to repeated injections at intervals of about 2–4 weeks in all cases where follow-up was possible—a real difficulty in our work with uneducated Africans. We have no information yet on the production of "oxidosis" by alloxan, nor have we tested the effects of dehydroascorbic acid as suggested by Dr. Loxton. We understand that other workers are investigating the action of this latter substance in experimental animals.

As for the remarks of Dr. Goldner (March 2)—we *were* unaware of the earlier studies on this subject, with some of which he was associated. We have now consulted the first two of his references, the third not being available. We feel that it is important to stress that following the 12 alloxan injections hitherto administered by us (repeated injections in several cases), renal damage has occurred in only one of eight cases—all with primary liver cancers. We did not induce any other untoward reactions (aside from transient flushing) by alloxan administered according to the method and dosage which we detailed previously. We venture to suggest the following explanation of the results reported by Dr. Goldner and others who attempted the use of alloxan on a limited number of cases suffering from various types of cancers (but none with primary hepato-cellular carcinomas which may perhaps be particularly susceptible to alloxan):

1. The nausea, vomiting, chilling, and cyanosis induced in some of their cases may well have been attributed to a pyrogen in their solutions and *not* to the alloxan, more especially since these reactions did not appear in *all* their or in any of our cases.

2. They administered enormous doses of alloxan, much more frequently than did we—e.g., 220, 400, and 950 mg. per kg. body-weight in human cases, in one case four times weekly, as compared with our usual dosage of 100 mg. and maximal 150 mg. at intervals of 2–4 weeks. Doses as large as those used by Goldner and his associates are well known to be severely nephrotoxic and hepatotoxic in dogs.

1. Galley, A. H., Rooms, M. *Lancet*, 1956, i, 990.
2. Mearns, A. G. D.P.H. Lectures, Glasgow University.
3. *Ephesians*, ch. 5, p. 25.

1. Glicksman, A. S., Rawson, R. W. *Cancer*, 1956, **9**, 1127.

3. The ineffectiveness of alloxan on the cancers in their cases, and the occurrence of renal and hepatic damage, may also have been due to the very slow rate of administration of this drug—in their cases given over an hour or more, as compared to 1 *minute* in all our cases. Duration of action of alloxan on islet cells is known to be very short-lived—alloxan having a half-life of only about 5 minutes in respect of its diabetogenic action. Perhaps its action in intracellular carbohydrate metabolism generally may also be short-lived, while hepatotoxic and nephrotoxic effects may perhaps occur only after long exposure to some other action of alloxan.

In the light of the above, we do not think that Dr. Goldner's evidence contradicts our findings or contra-indicates further testing of alloxan in the treatment of carcinoma in man—especially if our dosage and method of preparation and administering alloxan are strictly adhered to, and if urine and blood are examined for evidence of renal damage before treatment. On ethical grounds, the consistently hopeless prognosis, at least in our cases, justifies almost any therapeutic measure, which holds out *any* hope of improvement. Moreover, Sir, further studies—both clinical and experimental—in our laboratories clearly indicate certainly the theoretical and possibly also the practical value of alloxan therapy for understanding carcinogenesis. We have now treated a total of eight patients. In two of these, in whom hepatic pain was so severe as to require the use of analgesics, this symptom disappeared promptly and completely in both within 24 hours of the first alloxan injection. In four cases the grossly enlarged liver diminished in size—in one by three fingers' width—within a fortnight of the first injection, and without deterioration in the clinical condition during this period. Finally, our preliminary experimental observations in rats indicate that the metabolism in the ciliary body of alloxanised rats is influenced by feeding butter-yellow and also that the carbohydrate content of the benign hepatomas (preceding true malignancy inducible by butter-yellow in rats) seems to be different in alloxanised as compared with control rats. These experimental findings suggest that the effects of alloxan on cancer induction or tumour growth may perhaps not be attributable solely to its diabetogenic action via the pancreatic islets, but possibly to some more subtle and diffuse effect on the carbohydrate metabolism and thereby on protein synthesis in all cells to a varying degree, but especially in carcinoma cells. Experimental and clinical investigations on the actions of alloxan in carcinoma are being continued in our laboratories and hospital.

Schlesinger Organisation
Medical Research Unit,
Department of Physiology,
and King Edward VIII Hospital,
Faculty of Medicine,
University of Natal, Durban,
South Africa.

THEODORE GILLMAN
MICHAEL HATHORN
N. McE. LAMONT.

SIR,—I found the observations of Professor Gillman and his colleagues stimulating. Dr. Loxton's comments on alloxan and cancer of the liver were also very interesting. He was referring to Warburg's discovery that, in cancer cells, respiration is decreased and glycolysis increased: alloxan may be able to block the main pathway—glycolysis—from which cancer cells derive their free energy and thus retard their growth.

Dr. Goldner has referred to earlier trials of alloxan in cancer.

I should like to report my own observations on 2 patients treated with alloxan. They were selected in the course of experiments designed to increase resistance to cancer growth or to reduce its invasiveness. They were given repeated injections of alloxan but in smaller doses than those of Gillman et al. Alloxan failed to induce diabetes and there were no obvious clinical signs of hepato-renal damage. Of interest also is the post-mortem report in one case by Dr. J. C. Burne.

"Liver: subcapsular adenocarcinoma; central congestion of lobules. Bronchial lymph-node: papillary adenocarcinoma. Pelvic mass: papillary adenocarcinoma in wall of large intestine. Spleen: nothing abnormal. Pancreas: considerable postmortem autolysis, but no obvious hydropic or other change in islets.

"No obvious degenerative changes in malignant cells, but mitoses scanty compared with those seen in operation specimen."

These findings suggest that tumour growth may have been retarded, and that abnormal carbohydrate metabolism can be associated with cancer.

Bexley, Kent. W. GROSS.

CHRONIC BRONCHITIS AND SMOKING

SIR,—As one who was fortunate enough to attend the N.A.P.T. symposium on chronic bronchitis, recently mentioned in your columns (March 16, p. 593), may I draw attention to one considerable omission in this otherwise excellent series of papers? There was virtually no mention of cigarette-smoking—one of the major ætiological and/or exacerbating factors.

A N.A.P.T. pamphlet on chronic bronchitis describes smoking as "a very pleasant social habit." Medically, such a description is misleading, to say the very least; socially, it is just not true—as anyone will agree who considers the atmospheric pollution, litter, fires, and financial hardship it produces. "It all depends which end of the cigarette you are on," as one of my friends aptly put it.

Leicester. J. P. ANDERSON.

BIRTHDAYS OF SPASTICS

SIR,—Dr. Bevan (Feb. 16) divides his sample of 62 spastics into three groups (table I) and notes that "The largest numbers were born in the period June to August (25)." He is *statistically* correct in suggesting that "This difference hardly seems to be a matter of chance" for $\chi^2 = 11{\cdot}38$ and $P = < 0{\cdot}01$. However, he may be *logically* incorrect if the three-group division was made *after* he examined the distribution.

TABLE I—MONTH OF BIRTH OF 62 SPASTICS

Month of birth	Observed	Expected	χ^2
XII, I, II, III	10	20·68	5·52
VI, VII, VIII	25	15·51	5·81
IV, V, IX, X, XI	27	25·85	0·05
—	62	62·04	11·38

TABLE II—MONTH OF BIRTH OF 209 SPASTICS

Month of birth	Observed	Expected	χ^2
I	20	17·42	0·38
II	15	17·42	0·34
III	17	17·42	0·01
IV	21	17·42	0·74
V	20	17·42	0·38
VI	19	17·42	0·14
VII	16	17·42	0·12
VIII	21	17·42	0·74
IX	20	17·42	0·38
X	13	17·42	1·12
XI	12	17·42	1·69
XII	15	17·42	0·34
—	209	209·04	6·38

In our series of 209 spastics which were taken from a larger series of 448 cerebral palsy children, the months of birth were randomly distributed throughout the year (table II) for $\chi^2 = 6{\cdot}38$ and $P = 0{\cdot}90$.

Department of Medical Genetics,
The Montreal Children's Hospital,
and Department of Genetics,
McGill University.

JULIUS D. METRAKOS
GILBERT I. PAUL.

OBSTETRIC FLYING-SQUADS

SIR,—I have read Professor Nixon's letter in your issue of March 16.

I should like to point out that the rules of the Central Midwives Board do not prohibit the administration of ergometrine with the crowning of the head by midwives in domiciliary practice.

Central Midwives Board, London, S.W.1. ARNOLD WALKER Chairman.

SIR,—As one who has for seven years worked among unurbanised tribal Africans in the Belgian Congo, I may perhaps be permitted to comment on Dr. Grantly Dick-Read's statement last week that postpartum hæmorrhage is almost absent in uncomplicated labour in such a population. This is definitely not the case.

Such well-recognised predisposing factors to postpartum hæmorrhage as multiparity, anæmia, and multiple pregnancy are commonly present in these people. Every year we admit to the Baptist Mission Hospital at Bolobo, Belgian Congo, a number of women who have been reduced to a severe degree of anæmia by postpartum hæmorrhage.

I would agree with Dr. Dick-Read that much serious postpartum hæmorrhage is due to faulty midwifery. It is difficult to imagine conditions under which more faulty midwifery is practised than among primitive Africans. In the area where I work, bearing down in the first stage is universally encouraged by ignorant village midwives. If the placenta does not separate, indiscriminate traction on the cord is practised, and where delivery is delayed interference of the most appalling kinds is indulged in. From experience I can assure Dr. Dick-Read that Africa is not the obstetric Utopia he imagines it to be.

Stoke-on-Trent. J. T. GRAY.

EFFECT OF QUINIDINE ON POTASSIUM FLUX

SIR,—In their preliminary communication (March 16) on the effect of quinidine on potassium flux Dr. Kärki and his colleagues state that at 37°C "the metabolic processes which drive Na^+ out of the cell and which raise the concentration of K^+ within the cell were active."

Since quinidine is a cell poison, we would expect quinidine (and probably most cell poisons) to have an unfavourable influence on such metabolic processes and to retard the re-entry of K^+ into the cell. It seems premature, however, to conclude that "this finding makes it seem likely that the action of quinidine is due to a reduction of the permeability of the cell membrane to potassium."

Rotterdam. C. K. V. v. DOMMELEN.

FRACTURES OF THE FEMORAL NECK

SIR,—The review by Dr. Murray and Mr. Young (March 23) of the management and results of fractures of the femoral neck is a valuable presentation of fact, and as such is of great interest to all concerned with accident services. A study of the statistics gives a clear idea of the objects of the report, but note must inevitably be made of the high mortality-rate for both conservative and surgical treatment. The mortality for the total of 204 patients is 33%, for patients treated conservatively 48%, and for those operated on 26%.

Statistical comparison is often erroneous and in this instance may be invalid owing to unrecorded local factors, but on their face value these figures compare unfavourably with those from other clinics. The average mortality for 564 patients treated surgically, collected from the literature, was 16·8%.

It is surprising to find that these authors conclude by saying that "an emergency operation does not appear to be indicated . . . the best time for it probably lies between forty-eight hours and seven days after the fracture was sustained." I believe the reverse to be true—that is, that the operation should always be regarded as an emergency unless the patient is hopelessly moribund. It should be performed, not immediately, but within the first twenty-four hours.

Mervyn Evans,[1] reviewing the surgical treatment for trochanteric fractures in 101 patients from the Birmingham Accident Hospital, gave a mortality-rate of 10·9%. He wrote: "The best time to nail a trochanteric fracture is on the day of accident or on the following day, and where facilities are such that operation cannot be performed early it is probably better not done as a routine."

In my experience a careful anæsthetic and well-conducted operation, within twenty-four hours of injury, kills very few. It is often life-saving and almost invariably promotes a marked improvement both in mental and physical health.

London, W.1. PHILIP NEWMAN.

GOVERNMENT AND PROFESSION

SIR,—Many of us are sick at heart. We feel humiliated, degraded. We are letting the country down when she can least afford it.

In the National press we are classed with the rest of the strikers. The engineers are striking in designated areas only, presumably where they can do most harm. Are they following our suggestions or are we following them? And make no mistake about it, it is a strike we are contemplating, and *we* are striking at the old and the sick. The British Medical Association say that we may tell the patients that the fees we charge should be reimbursed by the Government; but isn't this a gamble, and if it does not come off, who loses? Not the doctor, who has already pocketed his 5*s*. or 7*s*. 6*d*. Then about medicines. The patient takes his form along to the chemist, and it is the chemist, poor man, who has to take the risk. If he supplies the medicines prescribed by doctors outside the National Health Service, and does not charge the patient, he may not get remunerated by the State, and if this happens it will not take long to ruin a small man. Again, we are not the ones who get hurt, it is either the chemist or the patient.

Strikes come. Pay goes up. There is increase in the cost of production, and the cost of living goes up. Strikes again and the circle is complete. Cannot we who do not practise medicine only for a monetary gain but perhaps, too, because we love our work, be the first to stop this vicious spiral?

Exmouth. ARMOREL NETTELL.

SIR,—If it is accepted that there is a just case for a rise in remuneration, then a settlement of this claim should be pursued. However, the very worse possible outcome of the present situation would be for a general rise of 24% in all our incomes, and I, and a good number of my professional colleagues, feel that our negotiators may be at fault in merely pressing the matter of remuneration whilst neglecting to stress the urgent needs for a reform of the service as a whole.

The needs for some reassessment and re-examination of the whole structure and organisation of the service after nearly ten years is very apparent to all those who work in it, and now that a Royal Commission has been formed it would be a pity if the opportunity for some such re-examination was missed.

Dealing primarily with matters of remuneration and speaking as a general practitioner, I would like to suggest a few possible measures that might be considered in any readjustment of our remuneration and as possible steps to improve standards and save public money. Before remedies can be discussed certain faults should be accurately defined.

(*a*) *Equal Pay for Unequal Work*

Apart from the present capitation fees which produce an increase in pay with the size of the practice, there is no

1. Evans, E. M. *J. Bone Jt Surg.* 1951, **33B**, 192.

grading of the services that are given by the doctor, and the size of a practice is certainly no criterion of the skill of the doctor or how hard he works.

(*b*) *Lack of Incentives*

There are at present no real financial incentives for improving standards. It is all too easy for a doctor to do the minimum of work and get away with it.

(*c*) *Lack of Supervision and Control of Standards*

Freedom of the individual to practise medicine according to his own views and principles must be jealously guarded and maintained, *But* at the same time since we are being paid out of public monies to care for our patients it seems only right that some steps be taken to ensure that the public is receiving a sufficient standard of medical care.

At present, apart from very infrequent visits by the local medical officer of the Ministry and the rather ludicrous attempt at "inspection" of practices carried out last year (the results of which have never been published) by the local medical committees, there has been no activity to see that the lay public are being cared for properly.

No-one likes "controls" or "interference" but, on the other hand, there exist innumerable safeguards in hospital practice to see that suitable standards are being maintained and these are accepted as inevitable and reasonable interferences.

If we are to receive increased remuneration then we should make it clear that we do not wish to receive it without at the same time endeavouring to remedy some of the faults of the present systems of remuneration and organisation, but the manner in which the claim is being pressed at present offers few such opportunities.

Increased remuneration should be selective and in proportion to the work done. Incentives must be provided for better work, and for the achievement and maintenance of high standards in general practice, and so must increased opportunities and scope for registrars in hospitals to climb the consultant ladder.

Expenditure must be cut by carrying out a drastic re-appraisal of the whole service and introducing some remedies to the ever-rising cost.

Having noted some of the faults what of the possible solutions?

The Royal Commission should have its terms of reference broadened to include this re-examination of the N.H.S. and its composition altered to include medical representatives.

Regarding future methods of remuneration, I suggest that in general practice this should continue on the present basis of a capitation fee with the increases being obtainable by increasing opportunities and incentives, as follows:

As a measure to improve standards and at the same time stressing the preventive side of general practice it is suggested that the practitioner is paid a fee of, say, 10*s*. for regularly examining certain of his patients at certain specified periods and completing a form, as is the present case with forms for vaccination and immunisation—at birth, in infants at 1 and 3 years of age; in children at 5, 10, and 15; in adults around the vulnerable middle age; in the elderly at retiring age of 60–65; and in the aged at 70 and then at regular 6 or 12 monthly intervals. In this way the average G.P. with a list of around 2500 will increase his remuneration by some £450.

A much more delicate matter that is somewhat allied to "merit awards" might be the provision of some such system whereby the practitioner who is providing a high standard of care would have a scale of increased remuneration based on some agreed standards. Thus, this scale might be based on the types of accommodation provided, on the organisation of the practice, including secretarial arrangements and record-keeping, on the provisions for investigations, on group practices, and so on. The manner in which this assessment is carried out would require further thought.

To balance these increased opportunities for remunerative rewards there must also be some *saving* of money.

With the practitioners undertaking an ever-increasing proportion of routine school and infant examinations then eventually there would be no need for the present local infant-welfare and school clinics. This would be a considerable public saving.

Prescribing costs must be reduced and methods for this purpose should be explored, beginning with an examination of the whole principles of therapy. A good deal of unnecessary and irrational prescribing undoubtedly occurs, especially in connection with the newest and most expensive drugs and it might be well to consider the reimposition of some brake on the excessive use of the broad-spectrum antibiotics and the corticosteroids by the reintroduction of the restrictions to their use to certain specific diseases. In hospitals junior residents should not be allowed to use these and other expensive drugs haphazardly without the specific permission of the consultant in charge of the case. The Cohen committee might also undertake a stricter revision of the categories of drugs allowable on E.C.10s.

The hospital services account for the largest bulk of the service and it is here that large measures of economy could be considered. It is surely reasonable to expect inpatients to contribute something towards their board residence. Time-and-motion studies should be carried out by "business efficiency" experts to see where further cuts can be made in the administrative services, for it is quite common to hear of hospitals where the administrative staffs have increased by as much as 200% since the N.H.S. began, without any increase in the clinical work of the hospital.

I feel sure that I am expressing the opinions of many of my colleagues in voicing my concern over the course of the present disagreements between the profession and the Government and in deploring the stress that is being laid on remuneration and the lack of mention, in official circles, of the needs for a complete reappraisal of the service.

Beckenham, Kent. JOHN FRY.

Parliament

The Government and the Social Services

IN opening this debate on March 19, Dr. EDITH SUMMERSKILL criticised the Government's social policy on the grounds that it placed "an undue and increasing burden on those least able to bear it," and would, if continued, seriously weaken the country's social services. As examples of this retrogressive trend she cited the reduction of the food subsidies, the increases in the price of school meals and milk, especially welfare milk, and the increased prescription charges. Yet though the Government had found time to introduce these economies, nothing had been done about the cost of proprietary drugs. Doctors, for instance, were still receiving lavish samples of tranquillisers, a practice which she described as "not only extravagant but harmful to the whole nation." She considered that the Government's policy revealed a characteristic disregard of the needs of the poorest and a lack of coördination among its own departments.

Mr. DENNIS VOSPER, the Minister of Health, maintained that the Government's policy recognised that the amount which could be spent on the social services was not unlimited. It was therefore important to eliminate waste and inefficiency and to make sure that the services were available to those most in need. He suggested that the Opposition when they were in power had failed to establish these priorities and as a result spread their resources in social services too thinly.

Turning to his own department for examples of improvements made possible by this realistic policy, Mr. Vosper said that the money allocated to hospital building would be £20 million in 1956–58 and he hoped that it would be possible to keep on allocating increased sums. Waiting-lists, though still too big, had fallen from 526,000 in 1953 to 433,000 in 1956. This was due to a better use of beds, which was in turn dependent on better recruitment. Every category of hospital staff had added to its members in the past few years. During the past five years 2000 more general practitioners had joined the service, and, though no-one could be complacent about the shortage of dentists, the number now practising was the highest ever known. The number of courses of dental treatment for 1956–57 for England and Wales was 11·1

million, 10% higher than the previous maximum before the introduction of charges.

The cost of the whole health service for Great Britain for 1957–58 would be £690 million compared with £450 million in 1949–50. Much of this increase was due to rises in pay and prices but there would be an increase of 15% in real terms. When the health service was started it was assumed that the Exchequer would bear 72·4% of the cost. This year it was bearing 80·2%. The proposed increase in the contribution would do no more than reduce the Exchequer percentage to 74·1. It would restore the contributory element by asking those who were at work to pay towards those who were not. Surely this measure was fair and fell on those who could bear it. The major part of the cost would still be borne by the taxpayer.

Whatever the merits of the charges, Mr. Vosper continued, the number of dental courses and sight tests were increasing to record levels. It was too early to judge the effect of the change in the prescription charge. December, 1956, compared with the previous December, showed a fall in the number of prescriptions of 25%, but January, 1957, showed a fall on the previous January of only 14%. He doubted whether vast savings could be made through restrictions on proprietary preparations.

He defended the increase in the prices of welfare milk on the ground that there was still a subsidy of 50%. School meals, he thought, were still a good bargain at 1*s.*, and here too it was surely good sense to reduce a general and indiscriminate subsidy to enable expansion in other directions.

CONTRIBUTION OR TAX

Miss ALICE BACON pointed out that, though more money had been spent on the social services in the past few years, population, prices, and wages had been rising. She reminded Members that the Guillebaud Committee had found that the cost of the National Health Service as a proportion of our national resources had fallen. She was uneasy about the increase in the National Insurance contribution which was to be earmarked for the health service. It seemed to carry an implied rejection of putting any further charge for this service on taxation. Mr. NIALL MACDERMOT feared that if more and more people were to pay directly for the social services, and where the burden was too heavy turn to the National Assistance Board, the principle that the social services were a right and not a charity would be lost.

Sir SPENCER SUMMERS thought that there was a danger that the ever-growing expenditure on the social services might, if uncontrolled, destroy the whole system. He suggested that it would be reasonable to expect people to carry individually the normal running expenses of life, such as spectacles, but to join together to protect themselves from such hazards as old age or a serious operation. Those who were receiving National Assistance, and indeed those who were just above the subsistence level, should of course be helped. In the normal running expenses of life he included two children. If the present family allowance for the second child in wage-earning families were discontinued, £55–£60 million would be available annually—perhaps to increase the allowances for the larger families or retirement pensions.

Mr. SOMERVILLE HASTINGS said that we had rightly decided that uneducated children and unhealthy people would be a national disaster and we had provided the social services to avoid this. He was hopeful that when the Minister of Health could give more attention to the prevention of illness the cost of the health service might be reduced. Dr. DONALD JOHNSON also put forward a claim for prevention, this time in the sphere of mental health, and asked for better domiciliary psychiatric services which, by keeping the patient in his home, would relieve and support our overcrowded mental hospitals.

Mr. R. P. HORNBY pointed out that the proportion of the cost of the health service borne by public funds was greater in Britain than in any other country in Europe —90% compared with 32% in Belgium, 30% in Sweden, 30% in Denmark, and 20–25% in Norway. He thought that the health service would gain if its demands were insulated to a greater extent from other demands on the Exchequer. The illusion that the weekly stamp paid for the health service was dangerous. It would be a gain if people realised what was involved in financing the service.

Mr. WILLIAM SHEPHERD was willing to accept the increased charge for the weekly stamp if the prescription charge could be abolished. Mr. JAMES GRIFFITHS was also prepared to reconsider the insurance contribution. In his view at 7*s.* 5*d.* it had become a kind of regressive taxation putting the biggest burden on those least able to bear it. The only person today who paid the full insurance contribution was the person who did not earn enough to pay income-tax. The flat contribution had reached the stage when it was an obstacle to progress.

Mr. JOHN BOYD-CARPENTER, the Minister of Pensions and National Insurance, said that it was not the duty of any Government to preserve every detail of the existing system, but to modify it by expansion in some directions and reduction in others. That was what the Government had been doing. Examples of expansion were the increases in benefits for widows and their children and for disabled war-pensioners, and the improvement in the earning-limit for retirement pensioners and in family allowances. In concentrating resources on the areas of greatest need the Government had taken into account that the bulk of the population had a higher standard of life than ever before.

Turning to the health service he said that no Government was prepared to allow any particular service to impose an unlimited charge on the Exchequer. If the cost of the health service must be limited there were three alternatives: increased charges, a cut in the service, or the addition to the stamp. Opinion could legitimately vary on the precise emphasis to be placed on one social service rather than another, but it was unfair and untrue to say that the Government had attacked the services as a whole. The worst betrayal of the services and their beneficiaries would be to allow their foundations to be eroded by financial strain, too heavy a load of expenditure to accumulate, and the whole system to collapse.

Foreign Patients and the N.H.S.

On March 18 Mr. GERALD NABARRO raised once more the question whether foreigners should not be charged for medical or dental treatment which they received under the National Health Service. The cost of the service was now high. The Government had been obliged to refuse an increase in remuneration to the doctors, to charge more for prescriptions, and to increase the weekly contributions. In circumstance of this kind, he thought it scandalous that foreigners, and others who could well afford to pay, were treated free, at the expense of the British taxpayer.

Mr. J. K. VAUGHAN-MORGAN, parliamentary secretary to the Ministry of Health, began his reply by pointing out that in this connection the term "foreigner" was not wide enough to cover these uninvited patients. More exactly they were "non-residents," for the group included not only foreigners but also Commonwealth citizens, those from overseas Colonies, citizens of the Irish Republic, and United Kingdom citizens resident abroad but here on holiday or on leave. The exact size of this group was not known. One estimate was 1,200,000, and of these he understood that about 800,000 stayed less than six months and the average length of stay was only a fortnight. Compared with the rest of the population that number was equivalent to about 12,000 bed-days at any given time and the total cost might be roughly estimated at £60,000. According to the London executive council's records, in any one quarter in the London area about 14,000 temporary residents were treated by general practitioners. Of these fewer than a quarter were from abroad. About 3000 were people from overseas. Australia headed the list, followed by the United States, the Irish Republic, South Africa, and Canada. On the basis of these figures the outside estimate of the cost of all non-residents using any part of the National Health Service was probably £150,000.

Two kinds of treatment were involved. First, there was accident or emergency. He thought that everyone would prefer to continue on what has been called the Samaritan principle but he wished there was more reciprocity with other countries. It was one thing to lead the world, but it was more consoling if others were following a little nearer behind. But the crux of the grievance was of course the alleged use of the hospital services for expensive operations and the dental and

ophthalmic services for costly work. In practice steps were taken to see that these privileges were not abused and that those who came here for the express purpose of obtaining free treatment were so far as possible prevented from doing so. All aliens coming into the country were interviewed, or could be interviewed, at the port of entry by immigration officers. One of the purposes of the interview was to satisfy the authorities that they were not coming here to exploit the health service. If there was reason to think that they were, those concerned were either not allowed entry into the country or the appropriate authorities were warned that they should be treated as private patients. Last year about 1000 foreigners were dealt with in this way. This procedure did not apply to Commonwealth citizens, but persuasion was used to achieve the same end, with some success. If there was any exploitation of the dental or ophthalmic services we had to remember that a substantial charge was made and possible delays in securing and completing treatment really made it available only for long-term visitors. But he agreed that the occasional loophole existed. In short we had the informal machinery to prevent exploitation, but it was informal and incomplete. To extend it would mean closer controls at the ports, imposing on doctors, dentists, and hospitals the unwelcome responsibility of discovering whether a patient was entitled to receive treatment, and bringing back the identity card at a cost of £1 million—surely a costly sledge-hammer for such a small nut. But the Government recognised the exacerbation which the present position caused. Though the problem was not as large as had been suggested, and though the solution was not easy, it was much on their minds.

Reciprocal Agreements

In a written answer the MINISTER OF HEALTH set out the following agreements under which British subjects may obtain medical treatment abroad:

Multilateral Agreements

A reciprocal agreement is in force between the United Kingdom, France, Belgium, the Netherlands, and Luxembourg for giving medical treatment to indigent persons. A convention extending this agreement to all members of the Council of Europe is in force between those countries which have ratified it (the United Kingdom, the Irish Republic, the Netherlands, Belgium, Norway, Denmark, the Federal Republic of Germany, and Sweden).

Bilateral Agreements

Under a reciprocal agreement with the Channel Islands visitors from the United Kingdom are provided with free inpatient and outpatient hospital treatment in Jersey and Guernsey and general-practitioner services (excluding dental or ophthalmic treatment other than emergency ophthalmic treatment) in Guernsey.

Agreements are in force whereby British subjects employed in France, Italy, the Netherlands, and Luxembourg who participate in the social-insurance schemes of those countries can have their United Kingdom insurance taken into account in reckoning their entitlement, and that of their dependants, to medical benefit. An agreement with Sweden, which is expected to be ratified shortly, entitles all British nationals in Sweden, including tourists, to use the Swedish health services. A similar agreement with Norway awaits signature.

Under Australian legislation free medical treatment is available to various classes of pensioners and their dependants. A reciprocal agreement enables citizens coming from the United Kingdom to Australia to qualify for such pensions, and hence for free medical treatment, by virtue of their United Kingdom insurance.

In general, the countries with which agreements have been made meet the major part of the cost of treatment.

Homicide Bill

This Bill has been passed by both Houses without amendment. It received the Royal Assent on March 21.

QUESTION TIME

Remuneration

Mr. MARCUS LIPTON asked the Minister of Health what consultations he was now having with the medical profession about the interim adjustment of pay for general practitioners.—Mr. DENNIS VOSPER replied: I have nothing to add to the Prime Minister's reply on March 19. Mr. LIPTON: If no consultations are taking place and if arbitration is denied, how on earth is this problem being dealt with? How long is this policy of drift and shift to continue? Will the right hon. Gentleman take note of the fact that both the *Times* and the *Daily Mirror* consider that general practitioners have a legitimate grievance? Mr. VOSPER: My right hon. Friend said he would make a statement in due course. Nothing has happened since March 19 to affect that position.

Bovine Tuberculosis in Scotland

The whole of Scotland is now within the area plan for the eradication of tuberculosis in cattle, and it is hoped that all the areas will be cleared by the end of 1959. At present 85% of the cattle of Scotland are in attested herds.

Mental Nurses

On Sept. 30, 1956, the mental hospitals of England and Wales had in their employment 10,709 whole-time and 197 part-time men nurses and 9649 whole-time and 6740 part-time women nurses. The estimated shortage, in terms of whole-time staff, was 2900 men and 4500 women.

Obituary

HENRY ERNEST SIGERIST

M.D. Zürich, Hon. D.Sc. Lond., D. Litt., LL.D., F.R.C.P.

Professor Sigerist died on March 17 at his home in the Swiss village where, since 1947, he had been working on his great new history of medicine. As a historian, he was unusual in his interest in the present. His fine intellect enabled him to be a scholar, but his intelligence and his enjoyment of the world made him much more. His approach was not that of the antiquarian: he was always, he said, primarily interested in the general problems of medicine, investigating the past in order to get a clearer understanding of our own time and to help in preparing the future. "To me the best way to understand a complex phenomenon has always been to study its genesis." He early recognised, too, that medicine is but one aspect of the general civilisation of a country—"that it is always determined by the general cultural conditions and by an underlying philosophy."

His own 65 years were eventful enough. Born in Paris the son of a Swiss business-man, he was brought up in Zürich but at the age of 20 spent some time in London at the School of Oriental Studies. After graduating in medicine at Zürich in 1917 he served as a doctor in the Swiss army, worked as a pharmacologist, and held a chair in his own university. Then in 1925 came his first great opportunity, when he was invited to Leipzig to succeed Karl Sudhoff as director of the institute of the history of medicine, then unique. His career may now have seemed settled; but in 1932, during a long and active visit to the United States, which provided material for his brilliant *American Medicine*, he was asked by William H. Welch to succeed him in his chair at Johns Hopkins and take charge of the first American institute of the history of medicine. Already he had shifted from French to German, and the American appointment would mean adopting a third language—"which to a writer is a serious matter." But this was something that Sigerist, a good philologist, could take in his stride: apart from his professional studies in Arabic, Latin, and Greek, he was at home in Italian and Spanish and by 1936 he could get along in Russian.

In that year he was spending the second of two summers in the U.S.S.R. to collect information for his *Socialised Medicine in the Soviet Union*, first published

in 1937 and republished in 1947. This new book he regarded as a necessary complement to what he had written about America ; for he had thought for some time that " the future of medicine will largely depend on what will be done in the United States and the Soviet Union." But, like many other visitors to the Soviet Union at that time, he perhaps allowed his sympathies to be engaged too strongly ; and valuable though it is as an account of Russian medical organisation, his book too often leaves the impression that everything works as well as it is supposed to work. The man who believed that in America medicine " has infinitely more to give than the people actually receive," and that medicine throughout the world is still in its first stage, was something less than fully objective in his attitude to a country where he saw science worshipped and " its progress is applied to life immediately for the benefit of the people." That is not to say, however, that he was unaware of the cost.

During his years at Baltimore he visited not only Russia but also South Africa and India. Of the Indian expedition W. D.-C. writes :

We had gone as members of a specially selected group of health experts from various countries to give evidence before the Health Survey and Development Committee (usually known as the Bhore Committee after its chairman Sir Joseph Bhore) which was planning the future health services of India. Before giving our evidence we were all sent all over India to get an idea of the background of the committee's work by seeing the conditions and meeting the people of all kinds. Sigerist proved to be a delightful companion on such a journey, full of interesting information, acute in his observations, penetrating though always urbane in his inquiries, with a delightful sense of humour and tolerant of those with slower brains than his own. His intimate knowledge of Russia and its language provoked many questions from certain members of the committee attracted by what they had heard of Russian achievements, and I remember well Sigerist being asked on one occasion whether it was not true that the Russians had succeeded in a certain project. He paused momentarily and than answered quietly " Yes, but at the cost of five million lives."

In 1947 after some fifteen years in America, Sigerist returned to Europe, though still linked to Yale University as a research associate with professorial rank. He had produced various " interim " books, including *Civilisation and Disease*, and *The University at the Crossroads*, but he longed to get down to what was to be his final work. Unfortunately the plan was not to be fulfilled, and only the first of the eight volumes has so far appeared—his *Primitive and Archaic Medicine*. Though he was able to produce his Heath Clark lectures delivered at the London School of Hygiene in 1952, illness increasingly interfered with his activities.

Of this final period H. E. L. writes :

I had the pleasure of visiting Professor Sigerist last summer in the little village of Pura. It was obvious that he was still physically weak after a cerebral accident some months previously, but the conversation flowed easily and he insisted that I should not go, as I intended, after half an hour.

He spoke about his student days in Switzerland, his appointment at Johns Hopkins University, and the influence he found there of William Welch. He spoke about his work during the war when he built up some understanding of Russian medicine, and then ultimately of his return to Switzerland to do his " serious work." For me, it felt like being taken into a dim room, and then suddenly seeing it in a penetrating light which left me with a vivid image and a new appreciation. This he did again and again that afternoon.

Most of this talk was over tea. It turned out that he was a connoisseur of tea, and we were now tasting from about a dozen little sampling cups. On looking back now, I am sure that I was asked to stay probably because I did not ask for milk and sugar. The only demand that he ever made on his students from Asia, he told me, was that they should keep him supplied with exotic teas. But he also added : " The most interesting teas I buy from the shop in Piccadilly in London."

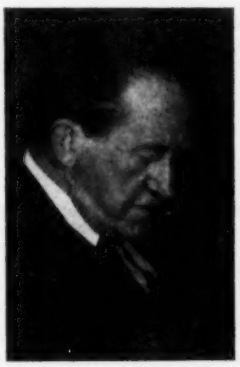
His serious work was the great *History of Medicine* of which he had completed the early volumes. Although he knew that he would not live to finish it, he felt that he had at least formulated the plans and laid the foundations. His untimely death has left a gap in the ranks of men who are civilising the world.

THOMAS GRAINGER STEWART

M.D. Edin., F.R.C.P.

Dr. Grainger Stewart, consulting physician to the National Hospital, Queen Square, with which he had been actively associated for over forty years, died at his country house at Wantage on March 18, at the age of 79.

The son of Sir Thomas Grainger Stewart, professor of the practice of physic at Edinburgh University, he was educated at Edinburgh Academy and Edinburgh University, where he graduated M.B. in 1900. After holding a house-physician appointment at Edinburgh Royal Infirmary he came to London and in 1902 was appointed house-physician at the National Hospital, where later he was successively resident medical officer and assistant pathologist before being appointed assistant physician in 1908. For a short time he was on the staff of the Metropolitan Hospital ; and in 1909 he joined the staff of the West London Hospital, on which he remained until 1937. He was also neurologist to the Central London Ophthalmic Hospital. He obtained the M.R.C.P. in 1904. For his M.D. thesis in 1912 he was awarded a gold medal ; and the following year he was elected F.R.C.P.



During the 1914–18 war he worked at the Ministry of Pensions hospital in Hammersmith. His association with this Ministry continued until a few years ago, when he retired from Queen Mary's Hospital, Roehampton—a hospital in which he was greatly interested, and where his experience proved invaluable in assessing neurological disorders associated with Service conditions. At the National Hospital he became full physician in 1924. He was due to retire in 1942 ; but as many of his younger colleagues were on active service he went on working there until the war ended.

Dr. Grainger Stewart went to Queen Square at a time when great advances were being made in clinical neurology, and he made his own contributions to these, notably in two important papers written in collaboration with Sir Gordon Holmes. Their joint paper in 1905 on the Symptomatology of Cerebellar Tumours was a landmark in the diagnosis of destructive lesions of the cerebellum and the clinical differentiation between intra- and extra-cerebellar tumours. This report was followed in 1908 by their joint paper on the connection of the inferior olives with the cerebellum in man. In 1906 he drew attention in this journal to the occurrence of tremor in tumours of the frontal lobes. He was joint author with the late W. Aldren Turner of a Textbook of Nervous Diseases (1910).

F. M. R. W. writes :

To an old house-physician, and later, colleague of Dr. Grainger Stewart at Queen Square, the news of his death brings back many pleasant memories : of a high-principled and unselfish man, a considerate chief and colleague, a sound clinician of the old school, a conservative in the best sense of that abused word, and a man conscious in his later years of having lived into an age he liked less and less.

Haste was unknown to him, and slow in speech as in movement, his outpatient sessions and ward rounds were no brief events, but went on, regardless of the clock, until he had discharged his sense of duty to the task in hand. The weekly pattern of notional half-days that forms the chessboard upon which the modern consultant makes his permitted and allotted hospital movements could not have contained him, and had one, unkindly, explained it all to him and discussed its influence upon the life and thought of the physician of today, he would have been horrified.

When in 1939 so many of his young colleagues left Queen Square for activities elsewhere, he quietly took on outpatient work again and so continued until their return, when, as quietly, he disappeared almost unnoticed from the hospital.

Except as a young man he wrote little. An excellent textbook of neurology written together with his senior colleague, Aldren Turner, did not have the success it deserved. Indeed, after Gowers' classic text became out of date, the separate neurological text did not thrive in this country for very many years.

Nor was he a notably attractive clinical teacher, and it may be said that his house-physicians were the only real recipients of the great store of clinical knowledge and judgment that he possessed, and in these young men he inspired a deep affection. One of his most distinguished pupils, Professor Monrad Krohn of Oslo, was amongst Grainger Stewart's warmest admirers and friends, and to have inspired this feeling in a neurologist of international fame, himself a brilliant writer and teacher of neurology, is perhaps an indication for the discerning of the qualities that Grainger Stewart so unobtrusively possessed.

In 1922 Dr. Grainger Stewart married Lady Playfair, widow of Sir Patrick Playfair, who survives him.

FREDERICK WILLIAM PRICE

M.D. Edin., Hon. M.D. Belf., F.R.C.P.

Dr. Price, whose death we announced last week, served for many years as physician to the Royal Northern Hospital. Though his chief specialty was cardiology, he had also gained useful experience in diseases of the chest while working at the Mount Vernon Hospital and the City of London Hospital for Diseases of the Chest. But he will of course best be remembered by the famous textbook which is familiarly and respectfully known as *Price*.

Lafayette

He was the son of William Price of Weston-Rhyn, Shropshire, and he was educated at Ruabon Grammar School, North Wales, and the University of Edinburgh. After graduating M.B. in 1898 he held a house-appointment at the Edinburgh Royal Infirmary before coming to London to take up the post of assistant resident medical officer at the Brompton Hospital. After some years as pathologist and registrar to the City of London Hospital for Diseases of the Chest he became medical registrar at the Westminster Hospital. He was also at this time physician and pathologist to the Mount Vernon Hospital for Consumption and Diseases of the Chest. To this period belonged his collaboration with James Mackenzie and Arthur Cushny in the research on the efficacy of drugs in cardiac diseases. He also carried out independent investigations on the action of digitalis and aconite. In his opening address to the Academy of Medicine in Toronto in 1912 he described some of this work.

His growing reputation as a cardiologist led to his appointment to the staff of the Royal Northern Hospital, and of the National Hospital for Diseases of the Heart. He was one of the first physicians to restrict his private practice almost entirely to diseases of the heart.

His book on *Diseases of the Heart* appeared in 1918 and he contributed articles on his specialty to many of the well-known systems of medicine before his own appeared in 1922. In welcoming the first edition we said that "its place was in the hands of the practising physician," and for the past thirty years that is where succeeding editions have been. The task of revision, as carried out by Dr. Price, was arduous, for he was a painstaking editor, scrutinising and if need be modifying every page of every manuscript submitted. Despite periods of serious ill health he was himself responsible for the first eight editions, often working in his study when he was too unwell to go to hospital or see patients.

G. G. relates how Price used to go through a manuscript with a contributor:

I had a great shock the first time, for the pages were full of corrections and a schoolmaster would have given me very few marks in composition. He then proceeded to go through it line by line asking me exactly what I wanted to say and suggesting alterations which I usually accepted unless I expressed a different meaning. He was always anxious to vary the words so that I should not have too much repetition. Every now and then he would stop and say "Is this all necessary? I don't understand it." I used to reply "Yes," and perhaps give an explanation. He would usually thank me and continue reading aloud. The whole process took a long time, but he impressed his own style on the book and it was certainly easy to understand. I believe he treated all the contributors in the same way and some were much annoyed. Although I did not always agree with his corrections, I am grateful because I learnt a great deal from his comments. His book has certainly fulfilled his ambition—to be a credit to British medicine.

In 1943 Dr. Price married Miss Hilda Brown, of Bath. She survives him.

A memorial service is to be held at All Souls' Church, Langham Place, W.1, on Monday, April 1, at 12.30 P.M.

ISAAC JONES

M.D. Melb., F.R.C.P.

Dr. Jones, chief medical officer and consultant physician to the Metropolitan Police, died on March 24 at the age of 74.

An Australian by birth and education, he graduated from the University of Melbourne in 1909, and later held the appointment of clinical pathologist at Melbourne Hospital. After postgraduate study in Vienna, Berlin, and Paris he served during the 1914–18 war as a major in the R.A.M.C. On demobilisation he settled in London and for a time acted as deputy director to the medical unit at St. Thomas's Hospital. In 1929 he succeeded Sir Maurice Cassidy as chief medical officer at Scotland Yard. From that date until a day before his death he gave unstinted service to the Metropolitan Police. For this work, writes C. M. P., he was singularly well qualified by his vigorous personality and solid physique—in some degree developed by his Australian upbringing.

An uncompromisingly robust and common-sense attitude to clinical problems was associated with a deep knowledge of medicine especially in gastro-enterology. Though not trained in psychology, he recognised its importance in a force which is exposed to exceptional strains and was most successful in getting many men back on to a level keel by his understanding. On the administrative side he was responsible for the establishment of a most efficient dental service. To the police nursing-home and the convalescent home at Brighton he gave unswerving support and coöperation. The introduction of the National Health Service in 1948 considerably modified the medical control of members of the police. He accepted the position and by tact and management continued to maintain contact and indirect control to a remarkable degree.

At St. Thomas's Hospital he made many loyal friends and exerted a powerful influence on the teaching of practical medicine to many generations of students. But his main interest remained the welfare of the Metropolitan Police. Though by inclination a confirmed countryman, he took, in the opinion of his less energetic colleagues, absurdly short holiday breaks. By his devotion he won the confidence and affection of all ranks of the force—from commissioners to constables.

Dr. Jones was elected F.R.C.P. in 1939. He leaves a widow and two sons.

JOHN FREDERICK NICHOLL

M.B. Belf., D.M.R.

Dr. Nicholl, a senior cancer clinic associate at the Allan Blair Memorial Clinic of the Saskatchewan Cancer Commission, who died on Feb. 25, at the age of 39, was born in Belfast. He graduated M.B. from Queen's University in 1942, and after studying therapeutic and diagnostic radiology at University College Hospital, London, he was appointed senior assistant radiotherapist at St. Thomas's Hospital in 1946. He took the D.M.R. in 1949. In 1950 he went to Canada as chief of radiotherapy and associate in diagnostic radiology at Victoria General Hospital, Halifax, Nova Scotia. Four years later he joined the Allan Blair Memorial Clinic at Regina, serving as radiotherapist but giving most of his time to the expansion of the radio-isotope laboratory and the develop-

ment of newer techniques in this field. Outside his work his chief interest was ornithology and he was an enthusiastic member of the Regina Natural History Society.

He is survived by his widow, a daughter, and three sons.

KATE FRASER

C.B.E., M.D., B.Sc. Glasg., D.P.H.

Dr. Fraser, who was the first woman to take part in the work of the General Board of Control for Scotland, died on March 20 at the age of 79.

She was born in Paisley, where her father Dr. Donald Fraser was a general practitioner with a special interest in mental disorders. She took her B.SC. at Glasgow University in 1900 with special distinction in physiology and went on to study medicine, graduating M.B. in 1903. After holding resident appointments at the Bridge of Weir sanatorium, the Crichton Royal, and the Southern Counties Asylum at Dumfries she spent five years in general practice in Glasgow. With this she combined work at the Royal Hospital for Sick Children and for the Govan parish school board. Her interest in the problems of mentally defective children grew steadily, and by 1913 she was using Binet-Simon tests in their examination and assessment. In 1913 she took the D.P.H., and in the same year she was awarded the M.D. degree with high commendation for her investigation on syphilis as a cause of mental deficiency. She also studied the relationship of this disease to epilepsy. The reputation which she had already won was recognised by her appointment in 1913 as a deputy commissioner of the General Board of Control for Scotland. In 1935 she was appointed a commissioner. During her 33 years with the board she had a long record of distinguished service. Dr. Fraser was responsible for the setting up of the Ex-Service Psychiatric After-Care Organisation in Scotland. She successfully urged the inclusion of the mentally handicapped in the provisions of the Disabled Persons Employment Act. She was appointed C.B.E. in 1945.

After she retired in 1947 her wide experience of both hospital and community care of the mentally ill and the mentally defective continued to be of great value. While most of her time was given to the work of the Scottish Association for Mental Health, of which she was a founder member, she also served on various committees and on the board of management of two hospitals and was associated as psychiatric adviser with the work of several voluntary bodies. In 1952 she was made an honorary member of the Royal Medico-Psychological Association, of the Scottish division of which she had been chairman for three years.

T. F. writes:

Dr. Kate Fraser never seemed to become lost in the anonymity which so often invests the senior Civil Servant. Everyone knew and respected her. Yet she did not at all covet publicity; she was quiet, almost shy, fired with an obviously genuine interest in the welfare of the mentally afflicted which opened every door. She had no enemies and when, on retiral, she went to live in Paisley it was just in the expected nature of things that she should continue to give freely of her wisdom and administrative sense to the Scottish Association for Mental Welfare and, in particular, to the notable work long carried on in Paisley in the interests of retarded children—a work which she had helped to pioneer. Dr. Kate Fraser had a unique place in Scottish mental health affairs and in Scottish affection; she will be greatly missed.

A former colleague writes:

In Kate Fraser's earlier years as a deputy commissioner, roads and transport in the more outlying parts of Scotland (parts which she particularly loved) were less adequate than they later became. In visiting patients under guardianship—work which she greatly enjoyed—she walked for miles over tracks, crossing bogs barefoot to reach some isolated croft. Rather than return without seeing a patient in the most northerly island of the Orkneys, when the steamer could not berth because of the gale, she let herself be thrown from the deck, as the steamer swept past in the heavy sea, on to a pile of sacks on the North Ronaldshay pier and was storm-bound on the island for some days. The indomitable spirit that would not yield to bogs or gales was unquenched in her later years. Difficulties were still to her a challenge and although latterly her physical appearance became fragile she was still possessed of drive in planning and vigour in attack. Her strength of character was combined with a lively sense of humour, a happy friendliness, and a generous self-giving. To those who knew her well she has left the impact and influence of her great qualities of mind, heart, and spirit.

MALCOLM CAMPBELL

M.A., M.B. Edin., F.R.C.S.E.

Dr. Campbell died on March 13 at Droitwich where he had practised for many years as a consultant in rheumatology. He was born in Edinburgh of Highland parents in 1873, and he graduated M.A. from Edinburgh University in 1895 and M.B. in 1900. After holding a resident appointment at the Royal Infirmary he took his F.R.C.S.E. in 1902. He spent a postgraduate year in Paris where he studied obstetrics. In 1905 he was appointed as lecturer in obstetrics to the University of Edinburgh, and for the next three years he was assistant to Sir Halliday Croom.

In 1908 Campbell settled in general practice in Brechin, but in 1914 septicæmia, followed by pyæmic joint-infection, laid him low for months. He was sent to Droitwich as a patient and remained to practise. For a time he was medical officer of health for the borough, but he turned more and more to the practice of hydrology, and his reputation in this specialty grew steadily. In 1933 he was the British Government's representative in Toulouse at the International Conference of Hydrology, where his fluent French proved useful. During the late war he was a president of the Vigornian Society, which met at the Worcester Royal Infirmary, and whose meetings were stimulated by the enthusiasm of the many American Army doctors who were stationed in the district before D day. In the county he was a president of the Worcestershire Lawn Tennis Association and a vice-president of the Worcestershire Cricket Club. He was also an expert gardener, with a particular care and affection for roses, sweet peas, and orchids.

J. W. T. P. writes:

One of Campbell's chief distinctions latterly was his brilliance as an after-dinner speaker. His Irving-like appearance, his easy style, and his choice diction never failed to win approval, and many who never knew him personally will remember him in this capacity. But he will be missed by a great many people up and down the country, for under a somewhat austere and unapproachable exterior lay a kindliness which he was loath to show and an integrity which never wavered.

His only son, Dr. A. M. G. Campbell, is a physician to the United Bristol Hospitals.

GERALD STANLEY HOVENDEN

M.D. Lond.

Dr. Hovenden, who was a general practitioner in Barnes for over 50 years, died in Putney Hospital on March 14 at the age of 87. He was educated at the Whitgift School and qualified from Guy's Hospital in 1894, taking the M.D. Lond. two years later. In 1900 Dr. George Rodman, a cousin by marriage, who was in practice in Barnes and East Sheen, invited Gerald Hovenden and his twin brother to join him as partners. This they did and they remained in practice together till Dr. Arthur Hovenden's death in 1946. Dr. Gerald Hovenden finally retired only a few years ago.

A colleague writes:

During the late war, when his brother's health had broken down and his junior partners were called up, he managed to hold the practice together with only part-time assistance. His appearance of being unhurried, even when he was doing four men's work, is still remembered by his patients. He belonged to a generation when it was still possible for a general practitioner to claim that he was up to the standard of clinical assistant in the various specialties,

and he was a skilled anæsthetist with chloroform and ether; he performed many Ts. and As.; he was a good dental extracter; he was a particularly good pædiatrician (he had been a clinical assistant at Great Ormond Street); and he had a large midwifery practice.

His own family was the centre of his life and, through his kindness and understanding of human problems, he became the friend and counsellor to several generations of families in his practice. His unsparing devotion to his patients' welfare inspired complete trust, and his gentle, genial manner and obvious enjoyment of his simple pleasures were typical of a man who was contented with his life. He was also intensely interested in modern developments, both in medicine and in general—he was, for instance, a pioneer motorist. He loved riding and, up to the late war, was a familiar figure in Richmond Park, riding with his family. He was a keen walker and dinghy sailor and enjoyed holidays abroad. He was an excellent bridge and chess player; and the pleasure which he enjoyed from reading—in English, and in French and German—lasted till a few days before his death.

He was married twice and had one daughter and three sons. Two of his sons are doctors; one carries on his father's practice and the other is a surgeon commander in the Royal Navy.

DESMOND WILLIAM GEORGE FARIS

C.B.E., LL.D. Malaya, M.B. Lond., D.P.H.

Dr. Faris, who till last year was dean of the faculty of medicine of the University of Malaya, died at Hove on March 20.

He was born in 1901 and was educated at Thetford Grammar School in Norfolk and at Epsom College. He entered the London Hospital Medical College in 1919 and took the Conjoint qualification in 1924 and the M.B. Lond. in 1925. In the same year he was appointed as a medical officer in Malaya, and he took up his duties there in 1926.

He soon began to make a special study of preventive medicine, and he took the D.P.H. in 1931. His anti-malarial work and his keen interest in health conditions on rubber plantations and tin-mines earned high praise. During the Japanese occupation, he was interned in Changi camp, but he did not allow this to break his spirit and made a useful contribution to the life of the camp under harassing conditions.

After the war he was appointed chief medical officer of Singapore, and later he became principal of King Edward VII Memorial College of Medicine and, in due course, dean of the faculty of medicine in the University of Malaya. In this post his past experience in public health proved a valuable asset. He wrote the history of King Edward VII College and last year received the honorary LL.D. of the University of Malaya. His death, so soon after his retirement, will be regretted by his many friends of all races in the Far East.

JOHN GARVIN STEBBING

M.B. Lond.

Dr. Stebbing died on March 23 at the age of 32. Educated at Dulwich College, he began his career at Guy's Hospital in 1942, and he soon made his mark as a leader in work and in extracurricular activities. After he qualified he held house-surgeon posts at Guy's and then for a year he worked in the physiology department. Thereafter he spent two years on research of fundamental value in the department of surgery. As H. J. B. A. recalls, "in 1953 Stebbing decided to go into general practice in Bermondsey and from then until his death he devoted his great qualities as a doctor to the care of his patients. A certain shyness and a quiet manner concealed a strong character which was revealed to its full only during the last few years when, with superb courage, he carried on quietly with his work, knowing that he was suffering from an incurable disease, even though this work was interrupted from time to time for X-ray therapy. Throughout his life he adhered to the rigid standard of conduct which he inherited from his father, the late Dr. G. F. Stebbing, who, in his generation, also served the people of South London with such devotion and skill."

In 1955 Dr. Stebbing became a member of the council of the Medical Protection Society. He leaves a wife and daughter.

ALEXANDER ALAN GUILD

M.A. Camb., M.D., Edin., M.R.C.P., M.R.C.P.E.

Dr. Guild, consultant physician and physician superintendent of Lambeth Hospital, died in London on March 9 at the age of 40.

He took his preliminary medical course from Caius College, Cambridge, graduating B.A. with first-class honours in the natural sciences tripos in 1938. He was a college prizeman. He continued his studies at Edinburgh University, where he won medals in pharmacology, therapeutics, and public health, as well as a Murchison scholarship in clinical medicine. After graduating M.B. in 1941, he spent six months as house-surgeon at Edinburgh Royal Infirmary before he joined the R.A.M.C. He served with a field-ambulance in North Africa, Sicily, Italy, Palestine, and Greece, and was mentioned in despatches. He was appointed A.D.M.S., Land Forces in Greece, in 1945, and was demobilised with the rank of lieut.-colonel the following year.

After the war he returned to Edinburgh Royal Infirmary to take a postgraduate course in internal medicine, before becoming house-physician at the Southern General Hospital. He passed the Edinburgh M.R.C.P., with neurology as a special subject, in 1947, and took the M.D. the same year. In 1948 he took the London membership and the same year he became clinical tutor to the medical unit at the Western General Hospital, Edinburgh. In 1951 he was appointed physician superintendent at Lambeth Hospital. He was one of the authors of the section on neurology in Davidson's *Principles and Practice of Medicine*.

A colleague writes:

Guild had exceptional ability and a profound knowledge of medicine. In addition he had many interests outside medicine, including music, art, and architecture. He was widely read in the classics, languages, and history. He was a man of high principle and integrity who put his work before any other consideration. The welfare of his patients meant everything to him and he spared neither himself nor his staff to attain the highest standard of treatment. He took a special interest in the neurological work of the hospital. From his father he inherited a judicial outlook, and he proceeded with the utmost caution in any matter which might lead to litigation. In committee he could outline his policy with extreme clearness, for he never seemed to lack the right phrase to describe the subject under discussion.

His fellow consultants found him a loyal, upright, and friendly colleague. His junior staff held him in high esteem and learnt from him how to combine a good bedside manner with a thorough examination and investigation of a patient. His ward sisters regarded him with affection and respect. He was a hospitable man and many of the staff were welcomed at his home. When his house-officers sought his guidance in planning their future career he wrote them long and friendly letters.

In 1951 Dr. Guild married Miss Marion Bell, daughter of Sir Gordon Bell of Otago University, New Zealand. She survives him with two young children.

Appointments

BAILY, R. A. J., M.B. Camb., F.R.C.S.: consultant orthopædic surgeon, Weston-super-Mare group of hospitals.

BYERS, IRIS E., M.B. Dubl.: assistant maternity and child-welfare M.O., co. Durham.

COONEY, MARY F., M.B. N.U.I., D.C.H., D.P.H.: assistant maternity, child-welfare, and school M.O., Derbyshire.

KNAPPE, S. S., M.D. Warsaw: deputy medical superintendent, Sandhill Park Hospital, Bishops Lydeard, Somerset.

MACKINNON, N. A. M., M.B. Edin., D.P.H.: part-time consultant in dermatology, Northern Regional Hospital Board, Scotland.

MARKS, HANNAH M., M.B. Dubl., D.A.: anæsthetist (S.H.M.O.), West Cumberland group of hospitals.

RANDALL, D. H., M.B. Lond., F.R.C.S.: part-time consultant general surgeon, Rotherham Hospital.

TWOHIG, NORA T., M.B. N.U.I., D.C.H.: assistant maternity, child-welfare, and school M.O., Derbyshire.

VINCENT, H. R., M.R.C.S.: assistant A.M.O., Sheffield Regional Hospital Board.

WILLIAMS, R. F., M.B. Lond., D.M.R.D.: consultant radiologist, Aylesbury/High Wycombe area.

Births, Marriages, and Deaths

DEATHS

HOVENDEN.—On March 14, at Putney Hospital, Gerald Stanley Hovenden, M.D. Lond., of Glebeholme, Barnes, S.W.13, aged 87.

Notes and News

PLAN FOR WITHDRAWAL FROM N.H.S.

A LETTER addressed last week by the General Medical Services Committee to all practitioners in the National Health Service says that the British Medical Guild will take steps to obtain the resignations of all of them. These will be put into effect initially in selected areas, the number of which will be progressively increased if need be.

Practitioners in the areas selected will be asked to notify executive councils on July 2 of their intention to withdraw from the medical list from Oct. 2. They will not be asked to withdraw from the obstetric list. This means that from Oct. 2, with the exception of maternity medical services, general practice under the National Health Service will cease in these areas.

During October former N.H.S. patients will be treated privately but no private fees will be asked of them. The public will be informed that doctors in these areas are anxious to give the Government one last chance to honour the promises made to family doctors when they entered the N.H.S. in 1948, and that they are doing everything possible to avoid a position in which their patients suffer financially. Nevertheless, if the Government still decline to agree to a satisfactory settlement or to arbitration it will be necessary after Nov. 1 for general practitioners in those areas to charge their patients a standard token fee which it is recommended should be 5s. a consultation and 7s. 6d. a visit.

Patients will be given receipts for these fees, and will be advised to take them to the nearest National Insurance office "in order that the Government may have an opportunity of refunding the sums involved. Doctors will, of course, have discretion to waive or modify these fees in special cases. . . ." If a settlement is not reached, practitioners will later be compelled to make full economic charges for their services.

Practitioners who resign will be advised to issue prescriptions on private forms for the duration of the emergency. It will be for the Government to decide whether they will refuse to accept prescriptions issued in this way.

No National Insurance certificates will be issued. General practitioners will issue their own private certificate forms.

WORLD HEALTH ORGANISATION

TWENTY international experts met in Copenhagen last August to discuss research problems connected with the effects of radiation on heredity. The committee was apparently concerned with only the peaceful uses of atomic energy. Its report (which will be published within a few months, together with several specialised papers) says that "all man-made radiation must be regarded as harmful to man from the genetic point of view," but holds that some risk must be accepted in view of the potential contribution of nuclear energy to man's social and cultural development.

The report lists 13 fields in genetics needing urgent research if the harmful effects of radiation are to be minimised. The effects of radiation are probably additive and may not be felt for some generations. The radiation received by the gonads of the average individual is estimated at 2–5r in 30 years from natural sources, and 1–3r from medical X-ray examinations, besides smaller amounts from other sources. There is special danger in the increasing use of fluoroscopy by physicians who have had no formal radiological training.

An accompanying paper by Prof. R. M. Sievert, of Sweden, points out that many foodstuffs have lately been shown to contain artificial radioactive elements with a radiation level often greater than that of the natural elements; but the dose of radiation received by tissues from this source cannot yet be estimated. Among the recommendations of the report are an increase in research and teaching in human genetics, the systematic registration of hereditary diseases, and the collation of data on fertility, consanguineous marriages, and parental ages. The group was much impressed with the hazards from man-made radiation in medicine, industry, and experimental science.

AN ACCOUNT OF THE HEALTH SERVICES

THE Central Office of Information has issued a reference pamphlet [1] describing the National Health Service and the various other public-health services in Britain. There are also chapters on medical research and on professional training. The pamphlet presents much information in handy form.

1. Health Services in Britain. 1957. H.M. Stationery Office. Pp. 58. 3s.

Royal Society

The 25 newly elected fellows of this society include: Dr. Saul Adler, professor of parasitology in the Hebrew University, Jerusalem; Dr. E. C. Amoroso, professor of physiology in the University of London at the Royal Veterinary College; Dr. John McMichael, professor of medicine in the University of London at the Postgraduate Medical School; Dr. Bruno Mendel, professor of pharmacology in the University of Amsterdam; Dr. C. L. Oakley, Brotherton professor of bacteriology in the University of Leeds; Miss Charlotte Auerbach, D.SC., lecturer in animal genetics in the University of Edinburgh; Mr. J. F. Danielli, D.SC., professor of zoology in the University of London at King's College.

University of Oxford

It is proposed to confer the honorary degree of D.LITT on Prof. J. F. Fulton.

University of Leeds

At a recent examination the following degrees and diploma were conferred:

M.D.—Mary McMillan (with distinction).

M.B., Ch.B.—C. D. Holdsworth, P. H. Smith, Brenda Thiede (with second-class honours); J. S. W. Brierley, Dorothy C. Campbell, J. H. Chippendale, H. M. Chung, J. E. Cox, Norman Cross, Alan Darnborough, Eileen M. Gillespie, Philip Goodwin, L. L. Hemsy, P. H. Holmes, David Jarratt, D. T. Jones, Vera E. Lawton, J. W. Lewis, Mohsen Mahloudji, J. W. A. Moxon, D. T. Price, B. E. Roberts, Audrey Sarfas, Margaret Sawyer, Marion Sherman, J. N. Smith, R. I. Swires, R. J. Taylor, D. L. Thiede, F. E. Tomlinson, Barbara F. Turner, R. W. Turner, Brian Whitaker, Dorothy M. Wootton.

D.P.H.—E. W. G. Birch, Carl Burns, George Cust, J. A. G. Graham, John Harkness, M. E. O'Neill, John Pemberton, William Turner, J. A. G. Watson, Marianne H. Witt.

Dr. G. J. R. Soutter has been appointed lecturer in pædiatrics and child health.

University of Birmingham

Prof. Rustin McIntosh, director of pædiatric services at the Babies Hospital, New York City, will deliver the Leonard Parsons lectures at 4 P.M. on Tuesday and Wednesday, May 7 and 8, at the medical school. His subject will be growth and development.

Dr. E. H. L. Harries has been appointed lecturer in physiology.

University of Dublin

At a recent examination for the D.G.O. the following were successful:

Nand Kishore Allahbadia, B. H. Marten, Santosh Madan, Santosh Khosla, Saroj Kumar Ghosh, Parkash Jit Kaur, Simon Froman.

Royal College of Surgeons of England

At the annual dinner of the Faculty of Anæsthetists, on March 20, Mr. Dennis Vosper, the Minister of Health, expressed his belief in the National Health Service. The service would have been a bit different if it had been introduced more slowly; but once a big step forward had been taken it was difficult to take even a small step back. His job was to make the existing service work. Replying for The Faculty, Dr. Frankis Evans, its dean, spoke with pride of the research department, housed on the sixth floor of the Nuffield College. This lusty infant was now assured of a healthy childhood; for industry and the great foundations had come to their help. The director was unfettered by undergraduate or postgraduate teaching—a unique arrangement. The next major requirement was a chair of anæsthetics; and for this a capital sum of £150,000 would be needed. Sir Edwin Herbert replied for The Guests to a toast proposed by Dr. John Gillies, who welcomed Mrs. Pandit, the High Commissioner for India, as one "whose greatness—particularly as a champion of the underprivileged—is enhanced by her modesty."

At a meeting of the faculty, Dr. H. J. Brennan (Manchester) and Dr. H. H. Pinkerton (Glasgow) were elected to the board of the faculty for eight years. Dr. H. C. Churchill-Davidson (St. Thomas's Hospital) was re-elected to the board for four years.

St. Mary's Hospital, London

Mr. Edgar Lawley has been appointed chairman of the board of governors of this hospital in succession to Mr. Anthony de Rothschild.

Association of Clinical Pathologists

The general meeting of this association will be held at Torquay on April 11, 12, and 13.

Royal College of Obstetricians and Gynæcologists

At a meeting of council held on March 23, with Sir Charles Read, the president, in the chair, Mr. J. B. Blaikley was appointed to visit New Zealand and Australia, and Prof. T. N. A. Jeffcoate to visit Canada and the Caribbean area, both as Sims-Black professors.

Dr. Claud Taylor will deliver the William Blair-Bell lecture at the college, 58, Queen Anne Street, London, W.1, on Friday, May 24, at 5 P.M. He is to speak on mesodermal mixed tumours of the female genital tract. Admission is by ticket only, obtainable from the secretary of the college.

Hæmophilia Society

The annual general meeting of this society will be held on Sunday, April 7, at 3 P.M. at the Hospital for Sick Children, Great Ormond Street, London, W.C.1, when Sir Weldon Dalrymple-Champneys will deliver a presidential address.

Naval Medical Compassionate Fund

A meeting of the subscribers to this fund will be held at 2.30 P.M. on Friday, April 12, at the Medical Department of the Navy, Queen Anne's Mansions, St. James's Park, London, S.W.1, to elect six directors of the fund.

Royal Institute of Public Health and Hygiene

Prof. Philip Drinker, D.SC., who holds the chair of industrial hygiene at the school of public health of Harvard University, will deliver the Harben lectures for 1956 at the institute, 28, Portland Place, London, W.1, on May 13, 14, and 15 at 5 P.M. He is to speak on air pollution and the public health.

Wessex Rahere Club

A dinner of this club will be held at the Royal Clarence Hotel, Exeter, on Saturday, April 27. Membership of the club is open to all Barts men practising in the West Country. Further details may be had from Mr. A. Daunt Bateman, the hon. secretary, 11, The Circus, Bath.

National Spastics Society

Dr. C. P. Stevens has been appointed director of this society.

Dr. Stevens is a former deputy senior administrative medical officer of the South West Metropolitan Regional Hospital Board, and his last appointment was as general secretary to the John Lewis Partnership.

Stobhill Hospital, Glasgow

On March 19 Prof. J. W. Howie opened a new department of bacteriology at this hospital. Till now a disused Army building has served as laboratory. The new laboratory has cost between £12,000 and £14,000, but in Professor Howie's view it is still not up to the standard appropriate to a hospital like Stobhill. In preventing the spread of infection the public-health service and the hospital both turned to the laboratory, and he suggested that it had therefore an important part to play in bringing them together.

Drug Costs in New Zealand

Addressing the biennial conference of the New Zealand branch of the British Medical Association in Wellington, Mr. J. R. Hanan, the minister of health, said the individual doctor was responsible not only to his patient but also to the taxpayer. He was referring to the sharp increase in the social security pharmaceutical bill, which, he said, would exceed £2 a head of population this year. In 1948 the total cost of pharmaceutical benefits was £1,558,000. In 1956 it was £4,039,000. "If the doctor is not going to consider the cost, with due regard to medical need first," Mr. Hanan said, "then more controls will have to be established to keep the costs within the funds available."

Carlsberg-Wellcome Travelling Research Fellowships

The directors of the Carlsberg Foundation, in Copenhagen, and the Wellcome Trustees, in London, have decided to institute these fellowships, to encourage coöperation between Danish and British research-workers in human and animal medicine.

One fellowship will be awarded annually to a candidate from the United Kingdom for a year's work in Denmark and one to a Danish candidate for a year's work in the United Kingdom. The stipend may range from £800 to £1200 per annum for whole-time research. Travelling and some incidental expenses will be provided in addition. It is intended that the first fellowships will begin in September, 1957. Further information may be had from the scientific secretary of the Wellcome Trust, 52, Queen Anne Street, London, W.1. Applications must be submitted before April 30.

Faculty of Homœopathy

At a meeting of the faculty at the Royal London Homœopathic Hospital, Great Ormond Street, W.C.1, on Thursday, April 4, at 8 P.M. there will be a discussion on the treatment of migraine.

Association of Medical Microtomists

This association is to hold a demonstration of histological and allied techniques in the biology laboratory of Guy's Hospital Medical School, London, S.E.1, on Friday, April 5, at 7 P.M.

Medical Inspectorate of Factories

Dr. Sibyl Horner has been appointed Senior Medical Inspector of Factories in succession to Dr. E. R. A. Merewether, who will retire on Aug. 31.

Dr. Horner, who studied medicine at the London School of Medicine for Women and St. Mary's Hospital, qualified in 1919 and took the D.P.H. two years later. She held a house-appointment at Charing Cross Hospital and was an assistant medical officer in the school medical service of the London County Council before she joined the factory inspectorate. During her 32 years' service, including 9 as a deputy senior medical inspector, she has made a special study of industrial dermatitis.

Diary of the Week

MARCH 31 TO APRIL 6

Monday, 1st

MARLBOROUGH DAY HOSPITAL, 38, Marlborough Place, St. John's Wood, N.W.8
8.15 P.M. Dr. F. K. Taylor: Mental Epidemics and Similar Social Phenomena.

Tuesday, 2nd

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
5 P.M. Dr. L. C. Hill: Systemic Lupus Erythematosus. (First of two Lumleian lectures.)
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8.30 P.M. *Orthopædics.* Mr. E. Stanley Evans: Changing Patterns in Skeletal and Articular Tuberculosis. (Presidential address.)
GUY'S HOSPITAL MEDICAL SCHOOL, London Bridge, S.E.1
5 P.M. Dr. Alexander Nadas (Harvard Medical School): Complete Auriculo-ventricular Block in Children.

Wednesday, 3rd

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
5 P.M. Prof. R. M. James: Tumours of the Parotid Gland. (Moynihan lecture.)
ROYAL SOCIETY OF MEDICINE
3 P.M. (Charing Cross Hospital, W.C.2.) *Surgery.* Mr. Norman Lake: Spinal Anæsthesia; Mr. Norman Tanner: Gastro-enterostomy; Mr. A. R. Makey: Duodenal and Rectal Atresia.
5 P.M. *History of Medicine.* Dr. T. J. Rendle-Short: Worms in History with Special Reference to Children Mr. T. B. Layton: Horace Walpole's Quinsy.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Dr. H. D. Paviere: Relations of Hearing to Noise Exposure.
INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
5.30 P.M. Dr. H. A. Sissons: Bone Structure and Bone Pathology
MANCHESTER MEDICAL SOCIETY
4.30 P.M. (Medical School, University of Manchester.) *Medicine.* Dr. R. E. Smith: Immunological Problems of Virus Diseases.

Thursday, 4th

ROYAL COLLEGE OF PHYSICIANS OF LONDON
5 P.M. Dr. Hill: Systemic Lupus Erythematosus. (Second of two Lumleian lectures.)
ROYAL COLLEGE OF SURGEONS OF ENGLAND
5.30 P.M. Dr. R. D. Hoare: Angiography in Throat, Nose, and Ear Surgery.
ROYAL SOCIETY OF MEDICINE
8 P.M. *Neurology.* Mr. J. McN. Potter, Dr. E. C. Hutchinson, Dr. P. O. Yates, Mr. R. T. Johnson: Disorders of the Hind Brain Circulation.
UNIVERSITY OF SHEFFIELD
5.15 P.M. (University Building, Sheffield Royal Infirmary.) Dr. Bernard B. Brodie (Bethesda, U.S.A.): 5-Hydroxytryptamine, Reserpine, and the Central Nervous System.

Friday, 5th

ROYAL SOCIETY OF MEDICINE
5.30 P.M. *Anæsthetics.* Dr. Ole Secher (Copenhagen): Some Problems in Anæsthesia for Cardiovascular Surgery.
INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, W.C.1
5.30 P.M. Dr. E. J. Moran Campbell: Respiratory Muscles and the Control of Breathing.
MIDLAND THORACIC SOCIETY
3 P.M. (Prestwood Sanatorium, Stourbridge.) Dr. R. D. Cape: Corticotrophin in the Management of Pulmonary Tuberculosis; Dr. John Aspin: Steroid-treated Pleural Effusion; Dr. A. MacDonald: Occupational Risks in Local Industry.

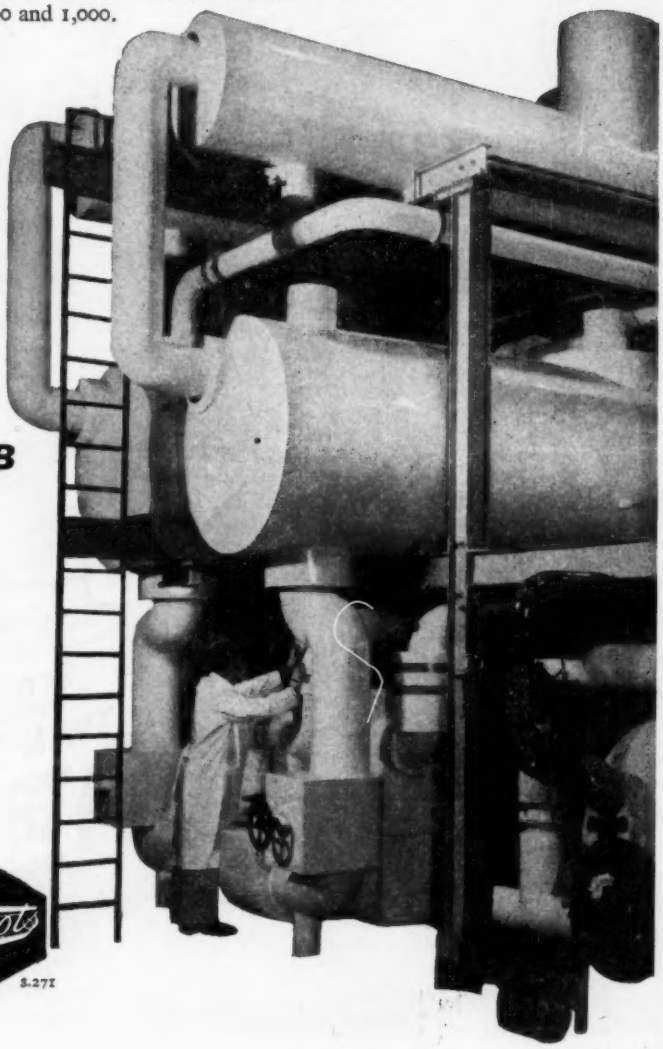
Boots

ALL-BRITISH CORTICOSTEROIDS

are manufactured in Nottingham in the most up-to-date corticosteroid plant in Europe. The following is a comprehensive list showing Boots full range of corticosteroid preparations.

Deltastab

(Prednisolone)—Tablets of 1 mg. Bottles of 30, 100, 500 and 1,000.
Tablets of 5 mg. Bottles of 30, 100 and 1,000.



PREDNISONE

Tablets of 1 mg. and 5 mg.
Bottles of 30, 100 and 500.

CORTISTAB

(cortisone acetate)
Tablets. Injection.
Eye Drops.
Eye Ointment.

HYDROCORTISTAB

(Hydrocortisone)
Tablets. Intrav. Injection.
Local Injection. Ointment.
Cream. Eye drops. Eye Ointment.
Lotion.

HYDROMYCIN

(Hydrocortisone with Neomycin)
Ointment. Ear/Eye Ointment.
Ear/Eye Drops.

Literature and further information gladly sent on request

BOOTS PURE DRUG CO. LTD.
NOTTINGHAM ENGLAND

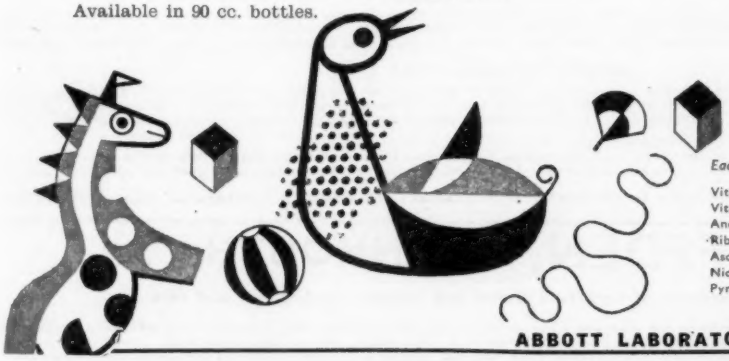
Boots

S.271

"Yes Doctor, I'm twice the baby since you advised starting me on solids with SCOTT'S Twin-Pack"
OAT
WHEAT
Scott's
BABY CEREAL
TWIN-PACK
OAT WHEAT
TWO SEPARATE CEREALS FOR VITAL VARIETY IN BABY'S DAILY DIET
Hungry?
Satisfied!
Fortified and ready cooked for weaning and early mixed feeding

He's heard the call...
for VI-DAYLIN
TRADE MARK

AT VITAMIN TIME it's never a problem to get children to take VI-DAYLIN. This pleasant vitamin supplement can be added to milk or juices, or given direct from the spoon. VI-DAYLIN has a carefully balanced formula . . . has no objectionable odour . . . will not stain clothes . . . and is stable at room temperature.
Available in 90 cc. bottles.



Each 5 cc. of VI-DAYLIN contains:—

Vitamin A	3,000 i.u.
Vitamin D (Viosterol) B.P.	800 i.u.
Aneurine Hydrochloride B.P.	1.5 mg.
Riboflavine, B.P.	1.2 mg.
Ascorbic Acid, B.P.	40 mg.
Nicotinamide, B.P.	10 mg.
Pyridoxine Hydrochloride	0.5 mg.

ABBOTT LABORATORIES LIMITED - LONDON

for sterling quality
—Scottish Widows'
of course.

THE HALL MARK OF
STERLING QUALITY IN
MUTUAL LIFE ASSURANCE

SCOTTISH WIDOWS' FUND

Head Office:
9 St. Andrew Square, Edinburgh, 2
London Offices:
28, Cornhill, E.C.3 17 Waterloo Place, S.W.1

PORTABLE X-RAY UNITS
SENSATIONAL OFFER

A large Ministry purchase of slightly used G.E.C. VICTOR PORTABLE X-RAY UNITS enables us to offer you the opportunity to possess your own X-Ray Unit, at a fraction of to-day's price.

COMPACT—POWERFUL—SIMPLE TO USE—
ECONOMICAL with QUALITY RESULTS

Offered at £100. Complete with portable stand.
Every unit guaranteed.

For further details write, call or phone:

STANDARD SUPPLIES
19, Eversholt Street, Euston Road, LONDON, N.W.1
Phone: EUSTON 2509

CHISWICK HOUSE
PINNER, MIDDLESEX
Telephone: PINNER 234

Private Nursing Home for Mental and Nervous Illness. All modern forms of treatment. Two country houses in adjoining grounds of 5 and 6 acres respectively, 12 miles from London. Trains every 15 minutes from Baker Street to Pinner.
DOUGLAS MACAULAY, M.D., D.P.M.

PARK SANATORIUM
(FORMERLY SANATORIUM TURBAN)
DAVOS-PLATZ, SWITZERLAND

First-class house, 5,150 feet above sea-level. Large park and wood belonging to the Sanatorium. Terms for board and residence, including room, medical treatment, etc., from Fcs. 18 per day. Prospectus.
Medical Superintendent, F. CHARLES, M.D.

ST. ANDREW'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS

NORTHAMPTON

PRESIDENT: THE EARL SPENCER

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultraviolet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

CLIFFDEN, TEIGNMOUTH

For the early treatment of nervous disorders and patients needing rest and care

A well-appointed House with spacious balconies and extensive views of the South Devon Coast. Beautiful garden and own dairy in 35 acres. In the same grounds, ROWDENS, a comfortable house with lovely views. Private road to the beach

There is also a charming house, EBWORTHY, MANATON, DARTMOOR, situated in 25 acres, 1100 ft. up for bracing moorland air

Resident Physicians—BERTHA M. MULES, M.D., B.S ANNE S. MULES, M.R.C.S., L.R.C.P. *Telephones*—TEIGNMOUTH 289 and 537

NORTHUMBERLAND HOUSE

Psychiatric Nursing Home

235-7 BALLARDS LANE, N.3 Tel.: FINchley 5283

Resident Med. Director Dr. R. M. RIGGALL,
Mem. Brit. Psycho-Analytical Socy.

Deep insulin coma unit, psychotherapy, etc. Fees from 12 gns.

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental illness. All types of treatment carried out. Accommodation for Alcoholics and Addicts available. Special Geriatric Unit now open. Fees from 7 gns. per week upwards according to requirements.

Apply to Dr. J. A. SMALL Telephone: Norwich 20080

THE MEDICAL PROTECTION SOCIETY LIMITED

Over 60 years experience in medical defence and protection

Complete Indemnity granted to members in cases undertaken on their behalf

ANNUAL SUBSCRIPTION: £1 for first three years for newly qualified entrants and £2 thereafter

Full particulars from the Secretary (Dr. Alistair French), Victory House, Leicester Sq., W.C.2. Gerrard 4553 and 4814

Vacancies

ACADEMIC AND EDUCATIONAL SECTION *Page* 36

ANÆSTHETICS

Brompton, S.W.3. Reg. 38
Hosp. for Sick Child., W.C.1. Sr. H.O. 40
London, E.1. Reg. 39
Mile End, E.1. Sr. H.O. 39
Nelson, S.W.20. Sr. H.O. 39
North East Met. R.H.B. Cons. .. 36
Queen Charlotte's & Chelsea Hosps. P.-t. Cons. 36
University College Hosp., W.C.1. Sr. Reg. 40
Birmingham. Dudley Road. Sr. H.O. 40
Birmingham R.H.B. P.-t. Cons. .. 37
Bournemouth & East Dorset Group of Hosps. Reg. 41
Bournemouth. Royal Victoria. Sr. H.O. 41
Brighton. Royal Sussex County. Sr. H.O. or Locum 41
Cardiff United Hosps. Cons. .. 36
Colchester. Essex County. Sr. H.O. .. 42
Enfield. Chase Farm. Temp. Reg. .. 42
Kettering Gen. Sr. H.O. 43
Leeds R.H.B. Reg. 43
Leeds R.H.B. Locum Sr. H.M.O. .. 37
Manchester R.H.B. Regs. 44
Northwood. Mount Vernon. Reg. .. 45
Plymouth. South Devon & East Cornwall. Sr. H.O. 45
Reading. Royal Berks. Sr. H.O. .. 45
Rochdale Infy. Sr. H.O. 46
Scotland. Western R.H.B. Cons. .. 37
Sheffield. City Gen. Reg. 46
Shrewsbury. Royal Salop Infy. & Copthorne. Sr. H.O. 46
Stockport Infy. Sr. H.O. 47
Torquay. Torbay. Sr. H.O. 47

BACTERIOLOGY

Newcastle United Hosps. Sr. Reg. & Clin. Asst. 44

CASUALTY

London, E.1. Reg. 39
Royal Northern, N.7. Sr. H.O. .. 39
St. Charles', W.10. Sr. H.O. 39
Aberdeen Gen. Hosps. B.O.M. Jr. H.M.O. 40
Blackpool Victoria. Jr. H.M.O. .. 41
Cardiff United Hosps. Sr. H.O. .. 41
Coventry & Warwickshire. Jr. H.M.O. 42
Croydon Gen. Reg. 42
Derby. Derbyshire Royal Infy. Sr. H.O. 42
Enfield. Chase Farm. Sr. H.O. .. 42
Hertford County. Sr. H.O. 43
Hitchin. Lister. H.O. 43
Ipswich & East Suffolk. Locum Sr. H.O. 43
Isleworth. West Middlesex. Sr. H.O. 43
Newcastle R.H.B. Sr. Casualty Officer 37
Northwood. Mount Vernon. Sr. H.O. 45
Southampton. Royal South Hants. Sr. H.O. 46
Southport Gen. Infy. Jr. H.M.O. .. 46
Weymouth & Dist. Sr. H.O. 47

CHEST AND TUBERCULOSIS

Brompton, S.W.3. H.O.'s 38
London Chest, E.2. H.O.'s 38
Abergele Chest. Jr. H.M.O. 40
Croydon Group H.M.C. Sr. Reg. .. 42
Halifax Area H.M.C. Jr. H.M.O. .. 43
Harefield, Middx. Reg. 43
Manchester R.H.B. Reg. 44
Scotland. Northern R.H.B. Reg. .. 46
Scotland. Western R.H.B. Sr. H.M.O. 37
Watford Chest Clinic. Reg. 47

DERMATOLOGY
North West Met. R.H.B. P.-t. Cons. 36
Northampton Gen. H.O. 45

EAR, NOSE, AND THROAT
Hackney Group H.M.C. P.-t. Clin. Asst. 38
Hosp. for Sick Child., W.C.1. Reg... 39
St. James', S.W.12. Locum Reg. .. 39
Liverpool United Hosps. Temp. Reg. 44
Oxford R.H.B. Reg... 45
Salisbury Gen. Reg. 46

GERIATRICS
Whipps Cross, E.11. H.O. 40
Birmingham R.H.B. Cons. 37
Cardiff. St. David's. Sr. H.O. .. 41
Orpington, Kent. Sr. H.O... .. 45

INFECTIOUS DISEASES
Eastern (Fevers), E.9. H.O... .. 38
Coventry. Whitley. Reg. 42
Ipswich. St. Helen's. H.O... .. 43

MEDICINE
Aberdeen Gen. Hosps. B.O.M. Jr. H.M.O. 40
Bournemouth. Christchurch. Pre-reg. H.O.'s 41
Chichester. Royal West Sussex. Locum Reg. 42
Colwyn Bay & West Denbighshire. Locum Jr. H.M.O. 42
Doncaster H.M.C. Sr. H.O... .. 42
East Anglian R.H.B. Reg. 42
Edgware Gen. H.O.'s 42
Ipswich & East Suffolk. Pre-reg. H.O. 43
Leamington Spa. Warneford Gen. H.O. 43
Leeds R.H.B. Reg. 43
Luton & Dunstable. Sr. H.O. .. 44
Mitcham, Surrey. Wilson. H.O. .. 44
Plymouth. South Devon & East Cornwall. Sr. H.O.. 45
Port Talbot Gen. Sr. H.O. 45
Rhyl. Royal Alexandra. H.O. .. 45
Scotland. Northern R.H.B. Jr. H.M.O. 46
Scotland. Western R.H.B. Sr. Reg... 46
Southend-on-Sea. Gen. Locum Reg. 46
Stoke-on-Trent. City Gen. H.O. .. 47
Welsh R.H.B. Reg. 47
West Hartlepool. Gen. Sr. H.O. .. 47
Ibadan, Nigeria. University College Hosp. Sr. H.M.O. 37
Ibadan, Nigeria. University College Hosp. Jr. H.M.O.'s or Sr. H.O.'s .. 47
U.S.A. Holzer Clinic, Gallipolis, Ohio. Preceptor 38

NEUROLOGY
Central Middlesex, N.W.10. H.O. .. 38
National Hosps. for Nervous Diseases. Sr. Reg. & Sr. H.O. 39
Wakefield. Pinderfields Gen. Pre-reg. H.O. or Sr. H.O. 47

OBSTETRICS AND GYNÆCOLOGY
Hosp. for Women, W.1. Sr. H.O. .. 38
Marie Curie, N.W.3. H.O. 39
Princess Beatrice, S.W.5. Sr. H.O. .. 39
Thorpe Coombe Maternity, E.17. H.O. 40
Bournemouth & East Dorset H.M.C. Reg. 41
Bromsgrove Gen. Pre-reg. H.O. .. 41
Bury & Rossendale H.M.C. Pre-reg. H.O. 41
Cardiff. St. David's. H.O. 41
East Anglian R.H.B. Reg. 42
Enfield. Chase Farm. Pre-reg. H.O. 42
Halifax Area H.M.C. Sr. H.O. .. 43
Harrogate & Dist. Gen. Sr. H.O. .. 43
Reading Combined Hosps. H.O. .. 45
Redhill County. Locum Reg. .. 45
Romford. Oldchurch. Sr. H.O. .. 46
Salisbury Gen. H.O... 46
St. Asaph. H.O. 46
Swansea. Sr. H.O. 47
Winchester. Royal Hants County. H.O. 47
Windsor. King Edward VII. H.O. .. 47

OPHTHALMOLOGY
Moorfields Eye, E.C.1. Reg. 39
Scotland. Western R.H.B. Sr. Reg... 46

ORTHOPÆDICS
Charing Cross, W.C.2. Sr. Reg. .. 38
St. James', S.W.12. Reg. 39
Whittington, N.19. Locum Reg. .. 40
Ascot. Heatherwood Orthopædic. Locum Reg. 40
Beverley. Westwood. Locum Sr. H.O. or H.O. & H.O. 40
Birmingham R.H.B. Sr. Reg. .. 40
Derby. Derbyshire Royal Infy. Reg. 42
Ipswich & East Suffolk. Sr. H.O. .. 43
Kingston, Surrey. Locum Sr. H.O... 43
Leeds R.H.B. Regs... 43
Leeds United Hosps. Reg. & Sr. H.O. 44
North West Met. R.H.B. P.-t. Cons. 36
Scunthorpe & Dist. War Mem. Reg... 46
Sheffield. City Gen. Pre-reg. H.O. .. 46
Shrewsbury. Royal Salop Infy. Sr. H.O. 46
Southampton. Royal South Hants. H.O. 46
St. Helens & Dist. H.M.C. Sr. H.O. 47
Stoke-on-Trent. North Staffs Royal Infy. H.O. 47
Winchester. Royal Hants County. Sr. H.O. 47

PÆDIATRICS
Fountain Group H.M.C. Jr. H.M.O. 38
Hosp. for Sick Child., W.C.1. Sr. H.O.'s 40
Queen Elizabeth Hosp. for Child. M.C. H.O.'s 39
Birmingham. Selly Oak. Sr. H.O. .. 41
Cambridge United Hosps. Reg. .. 41
Hemel Hempstead. West Herts. Locum Sr. H.O. 42
Leeds R.H.B. P.-t. Cons. 37
Luton & Hitchin Group of Hosps. Reg. 44
Newcastle R.H.B. Cons. 37
Nottingham City. Sr. H.O... .. 45
Romford. Oldchurch. H.O. 46
Warrington Gen. Sr. H.O. 47

PATHOLOGY
St. Mary's, W.2. Sr. H.O. 39
Beverley. Westwood. Sr. H.O. .. 40
Edgware Gen. Reg. 42
Enfield. Chase Farm. Sr. H.O. .. 42
Manchester. West Manchester H.M.C. Sr. H.O. 44
Portsmouth & Isle of Wight Area Pathological Service. Reg. .. 45

PLASTIC SURGERY
London, E.1. P.-t. Reg. 39
Scotland. Western R.H.B. Sr. Reg... 46

PSYCHIATRY
Connaught, E.17. P.-t. Clin. Asst... 38
Fountain Group H.M.C. Jr. H.M.O. 38
St. Marylebone Hosp. for Psychiatry & Child Guidance, N.W.1. P.-t. Reg. 39
Basingstoke. Park Prewett. Reg. .. 40
Birmingham R.H.B. P.-t. Cons. .. 37
Birmingham. St. Margaret's. Jr. H.M.O. 41
Bury & Rossendale H.M.C. Jr. H.M.O. 41
Cheadle Royal. Sr. H.O. 41
Hornchurch. St. George's. Temp. Reg. 43
Leeds R.H.B. Regs... 43
Lichfield. St. Matthew's. Jr. H.M.O. 44
Liverpool R.H.B. Sr. H.M.O. .. 37
North East Met. R.H.B. P.-t. Cons. 37
Manchester R.H.B. Sr. Regs. .. 44
Richmond, Surrey. Cassel Hosp. for Functional Nervous Disorders. Reg. 45
Scotland. Northern R.H.B. Cons. & Sr. H.M.O. 37
Scotland. Western R.H.B. Cons. .. 37
Sheffield R.H.B. Sr. H.M.O. 37
South East Met. R.H.B. Cons. .. 37
Welsh R.H.B. Cons. & Sr. H.M.O. 38
Wickford, Essex. Runwell. Sr. H.O. 47

RADIOLOGY
Central Middlesex, N.W.10. Reg. .. 38
Brighton & Lewes H.M.C. P.-t. Locum 36
Cardiff United Hosps. P.-t. Cons. .. 36
Leeds R.H.B. Locum Cons. or Sr. H.M.O. 37
Scotland. South-Eastern R.H.B. Sr. Reg. 46
Scotland. Western R.H.B. Sr. H.M.O. 37
Sheffield United Hosps. Reg. .. 46

RADIOTHERAPY
London, E.1. P.-t. Cons. 36
University College Hosp., W.C.1. Sr. Reg. 40
Birmingham R.H.B. Cons. 37
Birmingham United Hosps. Reg. .. 40
Western Australia. Royal Perth. Sr. Staff Radiotherapist 38

SURGERY
Battersea Gen., S.W.11. H.O. .. 38
Bethnal Green, E.2. Pre-reg. H.O. .. 38
Charing Cross, W.C.2. Regs. 38
Hornsey Central, N.8. Sr. H.O. .. 38
Hosp. for Sick Child., W.C.1. Sr. H.O.'s 40
King Edward Mem., W. Sr. H.O. .. 38
North Middlesex, N.18. H.O. .. 39
Queen Elizabeth Hosp. for Child. M.C. H.O.'s. 39
Royal Marsden, S.W.3. H.O. 39
South East Met. R.H.B. Regs. .. 39
St. George's, S.W.1, & Royal Hants County, Winchester. Sr. Reg. .. 39
Aberdeen Gen. Hosps. B.O.M. Reg. 40
Alton Gen. Sr. H.O... 40
Ashford, Middx. H.O. 40
Bedford Gen. H.O. 40
Birmingham Accident. H.O. 40
Birmingham R.H.B. Sr. Reg. .. 40
Birmingham United Hosps. H.O... 41
Blackburn Royal Infy. H.O. .. 41
Blackpool Victoria. Sr. H.O. .. 41
Bournemouth. Royal Victoria. H.O. 41
Brighton. Royal Sussex County. H.O. 41
Cardiff. Caerphilly & Dist. Sr. H.O. & H.O.'s 41
Carshalton. St. Helier. H.O. .. 41
Chichester. Royal West Sussex. Locum Reg. & H.O. 42
Douglas. Noble's Isle of Man. H.O. 42
Driffield. East Riding Gen. H.O. .. 42
Durham. Dryburn. H.O. 42
Exeter. Royal Devon & Exeter. Sr. H.O. 42
Gravesend & North Kent. H.O. .. 42
Hemel Hempstead. West Herts. Pre-reg. H.O. 42
Hove Gen. Sr. H.O... 43
Hull. Victoria Hosp. for Sick Child. H.O. 43
Ipswich & East Suffolk. H.O. 43
Ipswich & East Suffolk. Pre-reg. H.O. 43
Kidderminster & Dist. Gen. Pre-reg. H.O. 43
Leeds R.H.B. Reg. 43
Maidstone. West Kent Gen. Pre-reg. H.O. 44
Manchester. Booth Hall Child's. Jr. H.M.O., Sr. H.O., & H.O. 44
Manchester R.H.B. Regs. 44
Manchester United Hosps. Sr. H.O.'s 44
Northampton Gen. H.O. 45
Northwood. Mount Vernon. H.O. .. 45
Oxford R.H.B. Reg... 45
Oxford United Hosps. Locum Sr. Reg. 45
Oxford Univ. & United Hosps. Sr. Reg. 45
Plymouth. South Devon & East Cornwall. Pre-reg. H.O. 45
Portsmouth Group H.M.C. Sr. H.O. & Pre-reg. H.O. 45
Redhill. East Surrey. Sr. H.O. .. 45
Richmond, Surrey. Royal. Sr. H.O... 45
Romford. Oldchurch. H.O... .. 46
Romford. Victoria. H.O. 46
Salisbury Gen. H.O... 46
Scotland. Western R.H.B. Sr. Regs. 46
Shrewsbury. Royal Salop Infy./Copthorne. H.O. 46
Southampton. Royal South Hants. H.O.'s 46
Stirling & Clackmannan Hosps. B.O.M. Pre-reg. H.O. 46
Stoke-on-Trent. City Gen. Pre-reg. H.O. 47
Stoke-on-Trent. North Staffs Royal Infy. Pre-reg. H.O. 47
Swansea. Sr. H.O. 47
Tunbridge Wells. Kent & Sussex. Locum R.S.O. 47
West Bromwich & Dist. Gen. Pre-reg. H.O. 47
Winchester. Royal Hants County. H.O. 47
Wolverhampton. New Cross. Pre-reg. H.O. 47

THORACIC SURGERY
Hosp. for Sick Child., W.C.1. Sr. Reg. 40
North Middlesex, N.18. Locum Reg. 39
Aberdeen Gen. Hosps. B.O.M. Reg. 40
Bournemouth. Royal Victoria. Reg. 41
Ilkley. Middleton. Sr. H.O.. .. 43
Leeds United Hosps./R.H.B. Reg... 43
Newcastle R.H.B. Reg. 45
Nottingham City. Sr. H.O. 45
Sully, Glam. Sr. H.O. 47

UROLOGY
Glasgow. Royal Infy. Sr. H.O. .. 43
Leeds United Hosps. H.O. 43

VENEREOLOGY
London, E.1. Reg. 39

GENERAL
Canada. Northwestern Gen., Toronto. Internes 47
Canada. St. Paul's, Vancouver. Jr. Rotating Internships 47
U.S.A. Binghamton City Hosp., N.Y. Rotating Internship 47

PUBLIC APPOINTMENTS 48
GENERAL PRACTICE 48
MISCELLANEOUS 48

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

UNIVERSITY OF LONDON
INSTITUTE OF ORTHOPÆDICS

COURSE ON SURGERY IN PARALYTIC DISORDERS
4TH–6TH APRIL, 1957
PROVISIONAL PROGRAMME

Reconstruction of paralysed upper limb	Mr. D. M. BROOKS
Reconstruction of paralysed lower limb	Mr. J. A. CHOLMELEY
Paralytic scoliosis	Mr. J. I. P. JAMES
Surgery in spastic paralysis	Mr. K. I. NISSEN
Less common neurological disorders of orthopædic interest	Dr. P. H. SANDIFER
Pott's paraplegia	Mr. H. J. SEDDON
Traumatic paraplegia	Mr. J. N. WILSON

The fee for this course (including lunch and tea) is 3 guineas.
Early application should be made to the Dean, at 234, Great Portland-street, London, W.1.

UNIVERSITY OF MANCHESTER

DIPLOMA IN BACTERIOLOGY

The COURSE for the Diploma in Bacteriology requires full-time attendance in the Department of Bacteriology for 1 academic year (OCTOBER–JUNE). It is suitable for those who have qualified in medicine, veterinary medicine and other branches of science related to bacteriology. The course includes general and systematic bacteriology, bacterial chemistry, serology, immunology, virology, mycology and statistics.

All candidates must present evidence of previous training approved by Senate as satisfactory for admission to the course and register as postgraduate students of the University.

Further particulars and forms of application may be obtained from the Secretary, Department of Bacteriology, York-place, Manchester, 13.

MANCHESTER UNIVERSITY

A SHORT INTENSIVE COURSE in the PRACTICE OF INDUSTRIAL MEDICINE will be held in the Department of Occupational Health, Manchester University, commencing MONDAY, 27TH MAY to SATURDAY, 1ST JUNE, inclusive. Numbers will be strictly limited. Registration fee £5 5s.

Applications should be sent to the Secretary, Nuffield Department of Occupational Health, Clinical Sciences Building, York-place, Manchester, 13, from whom further particulars may be obtained.

INSTITUTE OF ACCIDENT SURGERY
(in conjunction with the Board of Graduate Studies, The Medical School, University of Birmingham)

A COURSE ON FRACTURES OF THE EXTREMITIES
BIRMINGHAM ACCIDENT HOSPITAL
27TH–31ST MAY, 1957
PROGRAMME

Monday, 27th May	
2 P.M. Mechanisms, manipulations and complications of fractures of the upper limb	Mr. F. G. BADGER
3.15 P.M. Fractures in the aged	Mr. P. S. LONDON
Tuesday, 28th May	
10 A.M. Fractures of the shaft of the femur	Mr. RUSCOE CLARKE
11.30 A.M. Fractures of the neck of the femur	Mr. WILLIAM GISSANE
2 P.M. Fractures of the tibia and fibula	Mr. J. H. HICKS
3.15 P.M. Dislocations of the hip	Mr. H. PROCTOR
Wednesday, 29th May	
10 A.M. Fractures and dislocations involving the knee	Mr. F. G. BADGER
11.30 A.M. Fractures of the forearm	Mr. J. SMITH
2 P.M. Emergency management of closed fractures and dislocations	Mr. WILLIAM GISSANE
3 P.M. Discussion	
Thursday, 30th May	
9.30 A.M. Tour of the hospital and ward round	
11.30 A.M. Peripheral nerve injuries	Mr. R. M. ROAF
2 P.M. The painful shoulder	Mr. H. PROCTOR
3 P.M. Physiotherapy	Mr. RUSCOE CLARKE and Mr. R. B. BROOKES
Friday, 31st May	
10 A.M. Problems of open fractures	Mr. RUSCOE CLARKE
11.30 A.M. Hand injuries	Mr. P. S. LONDON
2 P.M. Discussion	

Arrangements will be made to provide facilities for those taking part in the course to attend emergency operations as they occur.

The fee for the course (including lunch and tea) is 7 guineas.

Applications and inquiries should be addressed to the Secretary, Institute of Accident Surgery, Birmingham Accident Hospital, Bath-row, Birmingham, 15.

THE FACULTY OF RADIOLOGISTS

The first KNOX MEMORIAL LECTURE will be delivered by ROHAN WILLIAMS, M.D., F.R.C.P., F.F.R., at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, on FRIDAY, 12TH APRIL, 1957, at 5 P.M.

Subject: "Multiple myeloma."

The Lecture is open to all members of the medical profession.

UNIVERSITY OF GLASGOW. Applications are invited for a LECTURESHIP IN BACTERIOLOGY. Salary according to placement on University scale for clinical teachers. The final maximum is £1750 p.a. F.S.S.U. and family allowance benefits.

Applications (12 copies) should be lodged, not later than 20th April, 1957, with the undersigned, from whom further particulars may be obtained.

ROBT. T. HUTCHESON, Secretary of University Court.

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of ASSISTANT to the Director of the Department of Child Health with duties commencing on 1st July, 1957. The appointment will be for 1 year in the first instance. Salary scale: £1500–£100–£1800 with superannuation and family allowance.

Forms of application are obtainable from, and should be lodged with, the Dean, Guy's Hospital Medical School, London Bridge, S.E.1, not later than 18th April, 1957.

AMENDED ADVERTISEMENT

NUFFIELD ORTHOPÆDIC CENTRE, Headington, OXFORD. The Trustees invite application from suitably qualified persons for the following scholarship:—

GIRDLESTONE MEMORIAL SCHOLARSHIP

Value £660 p.a. tax free, plus a living-out allowance of £160.

Applications, giving full personal details together with the names of 2 referees, should be received not later than 14th April, 1957, by the undersigned from whom full particulars can be obtained. JOHN MULLINS, Secretary to the Trustees.

UNIVERSITY OF BRISTOL. Applications are invited for 3 appointments as DEMONSTRATOR IN PATHOLOGY. Salary scale at present £700–£50–£900 p.a. according to qualifications and experience. (This scale is to be revised with effect from 1st August, 1957.) The duties include assistance with the teaching of medical and dental students and general pathology for veterinary students, and the conduct of autopsies. Facilities for research and experience of diagnostic histology are available.

Applications, giving full name, age, qualifications, details of education, and experience, together with the names of not more than 2 referees, should reach the undersigned, from whom further particulars may be obtained, on or before 23rd April, 1957.

H. C. BUTTERFIELD, Registrar and Secretary.

MEDICAL RESEARCH COUNCIL OF IRELAND. Applications are invited for appointment as PATHOLOGIST under the Medical Research Council of Ireland for the purpose of carrying out work in connection with a study of perinatal mortality being undertaken in association with the World Health Organisation. The post will be full-time and the appointment will be for a period of not less than 2 years. The salary will be in the range £1500–£2000 p.a. and will depend on experience, especially in the field of perinatal pathology.

Applications, stating qualifications and experience and giving the names of 2 referees, should be submitted not later than 30th April, 1957, to the Hon. Secretary, Medical Research Council of Ireland, 50, Merrion-square, Dublin, from whom further particulars may be obtained.

Hospital Services: Senior Appointments

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of CONSULTANT RADIOTHERAPIST (maximum part-time) to the Hospital. Candidates must hold the Fellowship of the Faculty of Radiologists.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 4th May, 1957. H. BRIERLEY, House Governor.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Full or maximum part-time CONSULTANT ANÆSTHETIST to the Leytonstone Group of hospitals, based on Whipps Cross Hospital, E.11, to include occasional duties at Forest Gate Hospital, E.7.

Applications (6 copies), and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 27th April.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CONSULTANT ORTHOPÆDIC SURGEON (6 half-days a week), Barnet General Hospital, Wellhouse-lane, Barnet, Herts (461 Beds). Successful candidate required to live within reasonable distance of the Hospital.

Applications before 6th May, 1957.

(2) CONSULTANT DERMATOLOGIST (2 half-days a week), Royal Northern Hospital, Holloway, N.7 (279 Beds).

Applications before 8th May, 1957.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. Applications are invited from suitably qualified registered medical practitioners for the appointment of ANÆSTHETIST (Consultant status) at Chelsea Hospital for Women on the basis of 1 notional half-day session weekly.

Applications, with the names of 3 referees, should reach the House Governor and Secretary, 339, Goldhawk-road, W.6, within 6 weeks of the appearance of this advertisement.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. Locum RADIOLOGIST required for 8 sessions per week from 8th to 28th September, 1957.

Applications, giving details of experience, with the names of 2 referees, to Group Secretary, Brighton and Lewes Hospital Management Committee, Royal Sussex County Hospital, Eastern-road, Brighton, 7.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited from suitably qualified medical practitioners for the appointment of CONSULTANT ANÆSTHETIST (whole-time or maximum part-time).

Applications, with the names of 3 referees, should be sent to the Secretary to the Board, United Cardiff Hospitals, Cardiff Royal Infirmary, Cardiff, not later than 27th April, 1957.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of CONSULTANT RADIOLOGIST (maximum part-time) at the Cardiff Royal Infirmary.

Detailed applications, with the names of 3 referees, should be sent to the Secretary to the Board, at the Cardiff Royal Infirmary, Newport-road, Cardiff, not later than 27th April.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(*a*) Part-time CONSULTANT CHILD PSYCHIATRIST (4 notional half-days weekly), duties in diagnosis and treatment of maladjusted children at Birmingham Child Guidance Clinics. Wide experience specialty and higher qualification essential. Must reside 5 miles radius Birmingham.

(*b*) Whole-time CONSULTANT RADIOTHERAPIST, duties mainly at Coventry and Warwickshire Hospital and also at Warneford Hospital, Leamington Spa. Higher qualification essential. Must reside 5 miles radius Coventry.

(*c*) Part-time CONSULTANT ANÆSTHETIST, Royal Hospital, Wolverhampton (3 notional half-days weekly). Higher qualification and experience thoracic anæsthesia essential. Must reside 5 miles Wolverhampton.

(*d*) Whole-time CONSULTANT PHYSICIAN (geriatrics), Stoke-on-Trent Group of hospitals. Responsible for organisation and control of geriatric services within the Group. Duties at City General Hospital where Geriatric Unit is to be established and 6 other hospitals where geriatric beds are available. Higher qualification and wide experience geriatrics essential. Must reside within 5 miles radius Stoke.

Applications (15 copies), stating name, age, nationality, present and previous appointments and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, by 29th April, 1957.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time Locum RADIOLOGIST (Consultant or Senior Hospital Medical Officer). Duties mainly at Scarborough Group of hospitals. The appointment would be for an initial period of 1 month subject to further extension.

Applications, stating age, qualifications and details of appointments held showing dates, together with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, as soon as possible.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer scale), Hull A Group of hospitals. Initial period of 3 months.

Applications, stating age, qualifications and details of appointments held showing dates, together with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, as soon as possible.

LEEDS REGIONAL HOSPITAL BOARD. Part-time CONSULTANT in Prediatrics (9 notional half-days per week) for duties at hospitals in Bradford and district. Person appointed to reside in Bradford. Post vacant on 25th August, 1957.

Applications (12 copies), stating age, qualifications and details of present and previous appointments with dates, and names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 15th April, 1957.

LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer) with duties at Deva Hospital and Birkenhead Mental Hospital. Applicants should possess the D.P.M. or an equivalent qualification and have inpatient and outpatient psychiatric experience.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be returned not later than 20th April, 1957.

VINCENT COLLINGE, Secretary to the Board.

NEWCASTLE REGIONAL HOSPITAL BOARD. NEWCASTLE UPON TYNE AND SOUTH-EAST NORTHUMBERLAND GROUPS OF HOSPITALS. CONSULTANT PÆDIATRICIAN (whole-time or maximum part-time) for hospitals in the above neighbouring groups. Main duties at the Hospital for Sick Children (Fleming Memorial) (92 Beds) and Walker Gate (309 Beds) Hospital, Newcastle; and at Tynemouth Victoria Jubilee Infirmary (100 Beds) and Preston Hospital (330 Beds) in the South-East Northumberland Group. Apportionment of time approximately Newcastle : South-East Northumberland = 5 : 4 sessions.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Senior CASUALTY OFFICER (whole-time) North-West Durham Group of hospitals—main hospital Shotley Bridge General (533 Beds). Duration of tenure of post not exceeding 4 years. The Senior Casualty Officer will be required, subject to the supervision of the Senior General Surgeon and Orthopædic Surgeon to organise the casualty work throughout the group. Resident, or non-resident to reside near main hospital; single accommodation available. Salary within range of £1475–£2025 p.a.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Part-time CONSULTANT PSYCHIATRIST to Romford Child Guidance Clinic, 62, Western-road, Romford (newly established to serve Romford and Dagenham areas) for 4 sessions a week.

Applications (6 copies), and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 27th April.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the posts of (1) CONSULTANT PSYCHIATRIST, and (2) ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) at Craig Dunain Hospital, Inverness. These posts are whole-time and houses are available.

Application forms and further particulars can be obtained from the undersigned, to whom applications should be returned by 27th April, 1957. A. M. FRASER, M.D.,

Secretary and Administrative Medical Officer.

Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments:—

CONSULTANT ANÆSTHETIST at the Glasgow Royal Infirmary. The appointment will be whole-time or part-time on the basis of 9 notional half-days per week.

CONSULTANT PSYCHIATRIST AND PHYSICIAN-SUPERINTENDENT, Crichton Royal Mental Hospital, Dumfries. A higher medical qualification is essential. The appointment will be whole-time or part-time on the basis of 9 notional half-days per week.

Whole-time ASSISTANT RADIOLOGIST based at the Dumfries and Galloway Royal Infirmary, Dumfries. Salary (at age 32 and over) on the scale £1575–£50–£2025.

Whole-time ASSISTANT TUBERCULOSIS PHYSICIAN based at the County Sanatorium, Oban. Salary (at age 32 and over) on the scale £1575–£50–£2025.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for Middlewood Hospital, Sheffield. House available. Salary scale £1575–£50–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 27th April, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited to fill a vacancy for a Whole-time CONSULTANT PSYCHIATRIST at St. Augustine's Hospital, Chartham Down, near Canterbury. In addition to duties at the Hospital the appointment will include extra-mural psychiatric outpatient clinics. Candidates should possess a D.P.M. and preferably a higher qualification; psychiatric hospital and outpatient clinic experience is essential, and candidates should have had experience in modern psychiatric therapeutic procedures, including psychotherapy and occupational therapy. Applicants may visit the Hospital.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment, and of war service, together with names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 13th April, 1957.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. Medical Staffing—Department of General Practice. The Board of Management invite applications from registered medical practitioners with the requisite experience for 3 new posts in the newly completed teaching hospital.

(1) SENIOR HOSPITAL MEDICAL OFFICER to work in the Department of General Practice and in the Staff Medical Service and to assist in their direction and organisation. A higher degree would be an advantage but is not essential. Candidates must have had wide clinical experience, especially in general practice, but including also tropical medicine and administration.

(2) JUNIOR HOSPITAL MEDICAL OFFICERS or SENIOR HOUSE OFFICERS to work in the Department of General Practice and in the Staff Medical Service. Previous experience of general practice or general outpatient work in the tropics is desirable. The appointments offer an opportunity for obtaining wide clinical experience as a basis for general practice or before starting Specialist training.

General practice in Nigeria is carried on almost entirely as a hospital outpatient clinic. The new department gives an opportunity not only for clinical work of great variety but also for training House Officers and students in general practice work. It is fully equipped, has nursing and clerical assistance, its own side-room and direct access to all laboratory and X-ray facilities. The salaries offered for the posts are :

Senior Hospital Medical Officer £1428 p.a. rising by 5 annual increments to a maximum of £1788 p.a.
Junior Hospital Medical Officer £1116 p.a. rising by 6 annual increments to a maximum of £1428 p.a.
Senior House Officer £1116 p.a.

In addition an expatriate doctor appointed would receive an inducement allowance of £270 p.a. on a salary up to £1284 p.a. or £300 p.a. when the salary exceeds £1284 p.a.

The appointment will be initially for 2 tours of from 12 to 18 months and will be renewable, by mutual agreement, for a further tour, except in the case of a Senior House Officer when the appointment will be for 1 tour of 12 months with the possibility of transfer to the Junior Hospital Medical Officers scale thereafter.

On satisfactory completion of service a gratuity of £37 10s. will be paid for each completed term of 3 months service.

An outfit allowance of £60 is payable on first appointment.

Partly furnished quarters are provided at a rental of 8½% of salary, excluding inducement allowance. An expatriate doctor appointed will be eligible for 7 days leave on full pay for each completed month of service in Nigeria. A Nigerian doctor will qualify for 5 days leave for each completed month of service.

Free first-class passages are provided for an expatriate doctor and wife on first appointment, on vacation leave and on completion of their agreement. Free first-class passages to Nigeria, will in certain circumstances, be provided for a Nigerian doctor.

Successful candidates will be eligible for children's allowances in accordance with the current regulations. When necessary, a loan may be granted to assist in the purchase of a car.

Arrangements can be made to enable successful candidates to continue their National Health Service superannuation scheme contributions and details of the revised salary and gratuity payable in such cases will accompany application forms.

Applications should be submitted not later than 20th April, 1957, on the appropriate forms which will be forwarded together with additional information on receipt of an addressed foolscap envelope by the Adviser on Staff Recruitment, London Office, University College Hospital, Ibadan, 57, Catherine-place, Palace-street, London, S.W.1.

WELSH REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer), Hensol Castle Mental Deficiency Institution, Pontyclun, Glam (779 Beds). Hospital provides all modern methods of training and treatment. Previous experience in mental deficiency essential. Successful candidate will work under direction of Consultant and should possess D.P.M. Unfurnished flat available or furnished flat for single person.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST, Morgannwg Hospital, Bridgend (2359 Beds). Applicants must have had wide experience in psychiatry, hold a Diploma in Psychological Medicine, be competent to take clinical responsibility and to participate in the work of the associated outpatient clinics and Domiciliary Consultant Service in the area served by the Hospital. Non-resident.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST, North Wales Hospital, Denbigh (1521 Beds, admission-rate over 1100). Applicants must have had wide experience in psychiatry, hold the D.P.M. and, preferably, a higher qualification in medicine; should be competent to take full clinical responsibility in this Hospital, and to participate in the Domiciliary Consultation Service in the 5 North Wales Counties and in the outpatient clinics held in the major general hospitals in the area. Non-resident.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WESTERN AUSTRALIA. ROYAL PERTH HOSPITAL. Applications are invited from holders of the Diploma of Radiotherapy for the full-time post of SENIOR STAFF RADIOTHERAPIST. Salary £A3120 p.a. The Senior Staff Radiotherapist will work under the over-all direction of a Senior member of the Honorary Medical staff, and will be responsible for duties of full-time staff; internal management of the Department; training of Technicians; arrangement of demonstrations and provision of radiotherapy teaching material. The Royal Perth Hospital is the main teaching Hospital associated with the University of Western Australia. It has more than 600 Beds and is extending. The selected applicant will be required to furnish a satisfactory medical certificate and X-ray.

In addition to all relevant personal details, applications must include particulars of qualifications, experience, and the names of 2 referees; and should reach the undersigned on or before 31st May, 1957. JOSEPH GRIFFITH, Administrator.

U.S.A. HOLZER CLINIC, Gallipolis, Ohio. Preceptor (internal medicine) required at 15-man specialty clinic, located in 150-Bed, fully-equipped, non-profit hospital. Functions as referral centre serving 100-mile radius. Only community type general hospital in area. All major specialties represented. University of Cincinnati active surgical residency affiliation. Preceptor works exclusively with 4 Board Certified Internists seeing 10,000 patients, 1600 hospitalisations, annually. Active teaching programme. Duties include medical clinic emphasising complete diagnostic studies and supervised hospital service. Unique opportunity for practical training with private clinic and general hospital. 1–3 years medical residency or equivalent required. Extremely valuable as practice time while studying for Boards or refresher training. 6–36 months appointments. Salary $5000–$10,000 considering qualifications. Good housing. Starting date open. Travel cost and maintenance to be discussed.

Reply to JOHN J. SCHWAB, M.D., Department of Medicine.

Hospital Services : Junior Appointments

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. HOUSE SURGEON/CASUALTY OFFICER (combined post), resident, vacant immediately. House Officer grade, not pre-registration and not recognised for F.R.C.S.

Apply, enclosing copies of 2 recent testimonials, to Hospital Secretary with whom arrangements can be made to view the Hospital.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, E.2. HOUSE SURGEON (pre-registration) required, vacancy 24th April.

Applications, stating experience and 2 testimonials, to Hospital Secretary.

BROMPTON HOSPITAL, S.W.3. Applications invited for the following posts :—

NON-RESIDENT HOUSE PHYSICIAN for which there are 2 vacancies for 6 months from 1st June, 1957. Duties include work in Outpatient Department and wards. Salary at the rate of £525 p.a.

RESIDENT HOUSE PHYSICIAN for which there are 2 vacancies for 8 months from 1st June, 1957. Duties include work in Outpatient Department, wards and Cardiac Department. Salary at the rate of £525 p.a.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 6th April, 1957, to KENNETH A. F. MILES, House Governor.

BROMPTON HOSPITAL, S.W.3. Applications are invited for the post of ANÆSTHETIC REGISTRAR (full-time). The appointment is for 1 year with eligibility for re-appointment.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 6th April, to KENNETH A. F. MILES, House Governor.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required in General Medical Neurological Department, post-registration. Appointment for 6 months from 9th May, 1957.

Applications, with 2 copy testimonials, to Medical Director by 6th April.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. REGISTRAR required in X-ray Department. Whole-time, non-resident appointment for 1 year in first instance under supervision of Consultant, will include teaching and some work in mass X-ray both within and outside the Hospital. Salary £850 p.a. in the first year, £965 p.a. in the second year subject to terms and conditions of service of hospital medical and dental staffs.

Application forms from, and returnable to, Secretary, Central Middlesex Group Hospital Management Committee, by 10th April, 1957.

CHARING CROSS HOSPITAL, W.C.2. Full-time Senior REGISTRAR in orthopædic and fracture surgery. Duties to commence early in May, 1957. F.R.C.S. (England) desirable.

Applications, on forms obtainable from the undersigned, to be returned by 8th April, 1957.

FRANK HART, Secretary to the Board.

CHARING CROSS HOSPITAL, W.C.2. 2 Full-time SURGICAL REGISTRARS (non-resident).

Tenable :—

(1) As soon as possible,

(2) From 1st September, 1957,

for 1 year in the first instance in each case.

Applications, on forms obtainable from the undersigned, to be returned by 15th April, 1957.

FRANK HART, Secretary to the Board.

CONNAUGHT HOSPITAL, Walthamstow, E.17. Clinical ASSISTANT required in the Psychiatric Department, for 1 session per week (Friday afternoon). Salary in accordance with Paragraph 10 (*b*) of service conditions—i.e., £175 a year for each weekly notional half-day.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

EASTERN HOSPITAL (Fevers), London, E.9. Registered HOUSE PHYSICIAN. Duties may include some work in Chest Unit. Facilities for postgraduate study for higher qualifications.

Applications to Group Secretary, Hackney Hospital, London, E.9, by 6th April, quoting EH/HO.

FOUNTAIN GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female, resident or non-resident) for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER. National Health Service salary scale. The Fountain Group caters for 660 mentally defective children, 80 adult female defectives, and 50 blind children, and provides wide experience in neurology, pædiatrics, and child psychology as well as in mental deficiency. There are clinical, neuropathological, and biochemical research units and clinical conferences are held weekly. Numerous lectures and demonstrations are given to students and graduates.

Applications, giving full particulars and names of 3 referees, to Secretary, Fountain Hospital, Tooting-grove, London, S.W.17.

HACKNEY GROUP HOSPITAL MANAGEMENT COMMITTEE. CLINICAL ASSISTANT (E.N.T.). Applications are invited from registered medical practitioners for the following Clinical Assistant (E.N.T.) sessions :—

Monday morning (Hackney Hospital).
Monday afternoon (Eastern Hospital).
Thursday morning, Friday morning } Hackney Hospital.

£175 p.a. per weekly half-day.

Apply Group Secretary, Hackney Hospital, London, E.9, by 8th April, stating sessions for which available.

HORNSEY CENTRAL HOSPITAL, Park-road, N.8. RESIDENT SURGICAL OFFICER (Senior House Officer grade) to assist the part-time Consultant staff. The post affords good general experience (medicine and surgery) and would be beneficial to a fully registered doctor intending to go into general practice and one reading for higher qualifications. The Hospital may be visited by direct arrangement.

Application forms obtainable from, and returnable to, the Group Secretary, Archway Group Hospital Management Committee, 46, Cholmeley-park, Highgate, N.6, by 8th April, 1957.

HOSPITAL FOR WOMEN, Soho-square, W.1. (Affiliated to the Middlesex Hospital.) Applications are invited for a full-time post of RESIDENT SENIOR GYNÆCOLOGICAL HOUSE OFFICER, vacant on 1st July, 1957. Appointment is for 6 months but the holder can apply for an extension of 6 months. Salary in accordance with the terms laid down for medical and dental staffs, less a deduction of £150 p.a. for residential emoluments. The appointment is recognised for the M.R.C.O.G. examination.

Applications, stating age, nationality, qualifications, and experience, supported by the names and addresses of 2 referees, must reach the undersigned not later than Monday, 8th April.

D. C. EMERY, Secretary.

KING EDWARD MEMORIAL HOSPITAL, Ealing. Senior HOUSE OFFICER (resident) required for general surgery, vacant 1st June. Recognised for F.R.C.S.

Applications, giving age, qualifications with dates, and experience, together with copies of 2 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by 15th April, 1957.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. 2 vacancies occur 1st June, 1957, for RESIDENT HOUSE PHYSICIAN. Appointment for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and post graded as House Officer. Duties include the Outpatient Department and Refill Clinic as well as wards.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials should reach the undersigned not later than 12th April.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR to the Department of Anæsthetics. D.A., or D.A. standard an advantage.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 11th April, 1957. H. BRIERLEY, House Governor.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR to the Accident and Orthopædic Department. A higher qualification, although desirable, is not essential, but experience in general surgery is necessary.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 11th April, 1957. H. BRIERLEY, House Governor.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of Part-time REGISTRAR to the Department of Plastic Surgery. A higher qualification, although desirable, is not essential. The successful candidate will be required to attend on 6 half-days weekly, and the duties will be divided between The London Hospital, its Annexe at Brentwood and the Hackney Hospital.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 11th April, 1957. H. BRIERLEY, House Governor.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR to the Venereal Diseases Department Laboratory. Duties include work in the clinical laboratories of the Hospital.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 11th April, 1957. H. BRIERLEY, House Governor.

MARIE CURIE HOSPITAL, 66, Fitzjohn's-avenue, Hampstead, N.W.3. GYNÆCOLOGICAL HOUSE SURGEON (radiotherapy), resident, required in April.

Applications, with copies of testimonials, to the Administrative Officer.

MILE END HOSPITAL, Bancroft-road, London, E.1. (484 Beds.) ANÆSTHETIST (Senior House Officer). Recognised for F.F.A.R.C.S. Post vacant 21st April, 1957.

Application forms, obtainable from Physician-Superintendent, to be returned by 5th April with copies of not more than 3 testimonials.

MOORFIELDS EYE HOSPITAL, City Road Branch, London, E.C.1 Applications are invited for the post of SIXTH HOUSE SURGEON (Registrar) (non-resident). The appointment is for a period of 4 months from 1st July, 1957, and the holder of the post at the completion of that time will be eligible for appointment of Fifth, Fourth, Third, Second Resident Surgical Officer and subsequently as Senior Resident Officer, for similar periods.

Applications should be submitted on the official form obtainable from the undersigned, stating age and qualifications, together with testimonials and photograph, and be received not later than 16th April, 1957.

A. J. M. TARRANT, House Governor.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of ASSISTANT HOUSE PHYSICIAN (non-resident) at The National Hospital, Queen-square, W.C.1. The post carries the grade of Senior House Officer. The appointment will be for 6 months.

Applications, with names of 3 referees, to be sent to the undersigned not later than 2nd April, 1957.

H. EWART MITCHELL,
Secretary to the Board of Governors.

The National Hospital, Queen-square, London, W.C.1.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited for the full-time appointment of MEDICAL REGISTRAR (non-resident) at Maida Vale Hospital for Nervous Diseases, London, W.9. Grading as Senior Registrar. Preference will be given to a candidate holding a higher degree who intends to specialise in neurology.

Applications, with copies of 3 recent testimonials, to be sent to the Secretary at Maida Vale Hospital, not later than 3rd April, 1957.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. RESIDENT ANÆSTHETIST (Senior House Officer grade). Post approved for the D.A. Vacant end of March.

Applications, stating age, experience and qualifications, with copies of testimonials and the name of 1 referee, should be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. HOUSE SURGEON (resident) required, for 1st May, for 6 months. General surgery and some E.N.T. surgery. Post recognised for F.R.C.S.

Applications (in own handwriting), stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital, by 9th April.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. Locum REGISTRAR in Thoracic Surgery, required for period 23rd April–16th May (both dates inclusive). Post offers experience in all types of tuberculous and non-tuberculous thoracic surgery.

Applications, giving full particulars, to Secretary of Hospital.

PRINCESS BEATRICE HOSPITAL, Earls Court, London, S.W.5. Applications are invited from fully registered medical practitioners for the post of OBSTETRIC HOUSE SURGEON, with gynæcology and maybe some general surgery. Resident. Senior House Officer grade. Vacancy from 11th May, 1957.

Applications, stating age, qualifications, and with 3 testimonials, to the House Governor, not later than 13th April, 1957.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Appli-cations are invited for the post of CASUALTY OFFICER (Senior House Officer grade), with duties in the E.N.T. Department, vacant 1st May, 1957. Post recognised for F.R.C.S.

Applications to be sent to the Hospital Secretary by 9th April, 1957.

ROYAL MARSDEN HOSPITAL, Fulham-road, London, S.W.3. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON (resident). Salary £525 p.a. The post is tenable for 6 months from 3rd May, 1957.

Forms of application are obtainable from the House Governor to whom applications, together with copies of 3 recent testimonials, should be sent not later than 12th April.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. HOUSE OFFICERS (2). Appointments will be made for 2 consecutive periods of 6 months commencing 1st June, 1957. First period as House Physician and second as House Surgeon and Casualty Officer.

Application forms may be obtained from the Secretary at Hackney-road and should be returned with copies of not more than 3 testimonials, on or before 17th April, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in General and Traumatic Surgery to fill a vacancy in the approved trainee establishment at the Bermondsey and Southwark Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 13th April, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in General Surgery at Dulwich Hospital, East Dulwich-grove, S.E.22, in the Camberwell Group of hospitals, where there is an association with King's College Hospital Medical School, for teaching purposes. The appointment may be resident or non-resident, but if non-resident the successful candidate will be required to sleep in during nights when on duty. No married quarters are available. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 13th April, 1957.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. Applications are invited for the post of SENIOR HOUSE OFFICER (casualty), non-resident (1 of 2).

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, to Hospital Secretary immediately.

ST. GEORGE'S HOSPITAL AND THE ROYAL HAMP-SHIRE COUNTY HOSPITAL, WINCHESTER. (Joint appointment.) Applications are invited for the post of SURGICAL FIRST ASSISTANT, in the grade of Senior Registrar. Candidates should hold the Diploma of Fellowship of the Royal College of Surgeons (England). The appointment will be for 1 year in the first instance, and the successful candidate will be required to take up duty as soon as possible after 1st May, 1957. The successful candidate will be required to serve part of the normal period as Senior Registrar in the St. George's Hospital Group and part at the Royal Hampshire County Hospital, Winchester.

Applications, stating age, education, qualifications, experience and the names of 2 referees, should reach the undersigned not later than 13th April, 1957.

P. H. CONSTABLE, House Governor.

ST. JAMES' HOSPITAL, Balham, London, S.W.12. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (orthopædic and trauma), vacant 1st July. Post recognised for F.R.C.S.

Application forms, obtainable from Group Secretary, Wandsworth Hospital Group, at above address, to be completed and returned by 13th April. (0179.)

ST. JAMES' HOSPITAL, Balham, S.W.12. Locum E.N.T. REGISTRAR required 1st April.

Applications, stating age, qualifications, experience and names of 2 referees, to Group Secretary at above address. (0180.

ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE, 48, Cosway-street, N.W.1. Applications are invited for the post of REGISTRAR in the Child Guidance Department for 1 session a week. Applicants should have had previous experience in child guidance.

Application forms obtainable from, and returnable to, Secretary to Committee, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 15th April, 1957.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited for the post of CLINICAL PATHOLOGIST, for a period of 8 months, with effect from 1st June, 1957; remuneration at Senior House Officer rates (first 2 months non-resident remaining 6 months resident). Applicants should have held 2 House Officer appointments at this Hospital or another hospital approved by the Board of Governors and preference will be given to those intending to specialise in pathology.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 9th April, 1957.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 1st July, 1957, for a RESIDENT REGISTRAR (Registrar grade) to the E.N.T. Department.

Further particulars and form of application which must be returned not later than Monday, 22nd April, 1957, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. A vacancy will occur in May, 1957, for a Full-time RESIDENT SENIOR SURGICAL REGISTRAR to the Thoracic Unit.

Further particulars and form of application which must be returned not later than Monday, 22nd April, 1957, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy for a HOUSE SURGEON (Senior House Officer) to the Orthopædic and Plastic Departments in May, 1957.

Further particulars and forms of application, which must be returned not later than 22nd April, 1957, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 15th July, 1957, for a JUNIOR RESIDENT ANÆSTHETIST (Senior House Officer).

Full particulars and form of application which must be returned not later than Monday, 6th May, 1957, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be vacancies for the following Senior House Officers on 15th July, 1957.

2 HOUSE PHYSICIANS.
2 HOUSE SURGEONS.

Further particulars and form of application, which must be returned not later than Monday, 6th May, 1957, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THORPE COOMBE MATERNITY HOSPITAL, Walthamstow, E.17. (58 Beds.) Applications are invited from medical Women for the post of JUNIOR OBSTETRIC OFFICER (graded House Officer), vacant 4th May, 1957. The Hospital is recognised by the Royal College of Obstetricians and Gynæcologists.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of SENIOR ANÆSTHETIC REGISTRAR (non-resident) for 1 year in the first instance from a date to be arranged.

Applications, with the names of 2 referees, to the Administrator and Secretary by 17th April, 1957.

UNIVERSITY COLLEGE HOSPITAL, Gower-street W.C.1. Applications are invited for the post of SENIOR REGISTRAR in the Radiotherapy Department for a period of 1 year in the first instance from 1st June, 1957, or as soon as possible thereafter.

Applications, with names of 2 referees, to Administrator and Secretary by 13 h April, 1957.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited from fully registered medical practitioners for the post of HOUSE OFFICER in the Geriatric Unit at above Hospital. The post, vacant now, offers excellent scope for persons interested in this specialty as the most modern methods of geriatric treatment are employed.

Application forms from the Hospital Secretary, to be returned by 8th April, 1957.

WHITTINGTON HOSPITAL, London, N.19. Locum Tenens ORTHOPÆDIC REGISTRAR required (non-resident) for 3 months from 1st April, 1957.

Write or call Medical Superintendent, Archway 3070, Extension 100.

ALTON GENERAL HOSPITAL, Alton. (136 Beds.) RESIDENT HOUSE SURGEON (Senior House Officer grade) required from 28th April to work under full-time Consultant Surgeon. There are 2 other residents. Post recognised for F.R.C.S.

Applications, with copies of 2 testimonials, to the Hospital Secretary.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in General Medicine at the Aberdeen Royal Infirmary. The post is non-resident. Salary and conditions of service are in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, P.O. Box No. 92, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the Casualty Department of the Outpatient Department of the Aberdeen Royal Infirmary. The post is non-resident. Salary and conditions of service are in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, P.O. Box No. 92, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of REGISTRAR in Surgery with main duties in the Aberdeen Royal Infirmary. The post is a whole-time one and is non-resident. Salary and conditions of service are in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, P.O. Box No. 92, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. WOODEND GENERAL HOSPITAL. Applications are invited for the post of REGISTRAR in the Thoracic Surgery Department of the above Hospital. The appointment, which is non-resident, is for a period of 1 year and is subject to the conditions of service issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, P.O. Box No. 92, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ABERGELE CHEST HOSPITAL, Abergele. (248 Beds —69 adult pulmonary, 179 children pulmonary and non-pulmonary. Hospital contains a major Thoracic Surgery Unit.) JUNIOR HOSPITAL MEDICAL OFFICER required at the above Hospital. Tenure of post limited to 3 years.

Applications, with 2 testimonials, to be sent forthwith to Group Secretary, Clwyd and Deeside Hospital Management Committee, "Rhianfa," Russell-road, Rhyl.

ASCOT, BERKSHIRE. HEATHERWOOD ORTHOPÆDIC HOSPITAL. Locum REGISTRAR (orthopædics) required immediately.

Applications, giving full details of experience and names of 2 referees, to Secretary.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON (Male) for general surgical duties, 6 months appointment, vacant 1st April, 1957. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

BASINGSTOKE. PARK PREWETT HOSPITAL. Park PREWETT GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGION. Applications are invited for the appointment of PSYCHIATRIC REGISTRAR at above Hospital. The appointment is to commence on 1st July, 1957. Residential accommodation can be provided for a single person.

Applications, with full details of qualifications and experience, should be sent to the Group Secretary, Park Prewett Hospital, Basingstoke, as soon as possible.

BEDFORD GENERAL HOSPITAL. (439 Beds.) House SURGEON required. Pre- or post-registration. Recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute Surgical Units.

Inquiries and applications, with copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds). Locum ORTHOPÆDIC HOUSE SURGEON (Senior House Officer or House Officer grading according to experience).

Applications to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post) vacant now. Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. ASSISTANT PATHOLOGIST (Senior House Officer grade) required in Area Laboratory. Offers experience all branches of pathology. Salary £745.

Detailed applications to Group Secretary.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds and 8 House Surgeons.) HOUSE SURGEON (resident), vacant April. Hospital largest Traumatic Unit in country and treats over 50,000 new patients each year. Recognised for purpose of Casualty by R.C.S.(Eng.). Teaching programme by Consultant staff. 6 months appointment, some of which can be spent in 42-Bedded Medical Research Council's Burns Unit.

Apply, naming 2 referees, to Administrator within 7 days.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (780 Beds.) SENIOR HOUSE OFFICER (anæsthetics), resident. Recognised for D.A. and F.F.A.R.C.S. Vacant 21st April, 1957. Extensive experience of anæsthetics not necessary. Duties include list and emergency work in general surgery, gynæcology, obstetrics, and E.N.T. at hospitals in the Group.

Detailed applications, with copies of 3 recent testimonials, to the Group Secretary.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(*a*) Whole-time SENIOR REGISTRAR in Orthopædic Surgery, Stoke-on-Trent group. Duties at North Staffordshire Royal Infirmary, Hartshill, and Biddulph Grange Orthopædic Hospital and other hospitals in the Group. Higher qualification/wide experience specialty required. Must reside within 5 miles Stoke-on-Trent.

(*b*) Whole-time SENIOR REGISTRAR (in plastic surgery or general surgery), Birmingham Selly Oak Group, duties at the Burns Unit, Birmingham Accident Hospital. Higher qualification essential. Appointment for 12 months. Applications received from fifth year Senior Registrars. Must reside within 5 miles of Hospital.

Application forms from Secretary, 10, Augustus-road, Birmingham, 15, to be returned by 15th April, 1957.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of REGISTRAR in Radiotherapy (non-resident Registrar grade) for duties in the Radiotherapy Department of the United Birmingham Hospitals. Candidates should preferably hold additional qualifications in medicine, surgery, gynæcology or physics.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned by 13th April, 1957.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. HOUSE SURGEON post vacant now for period to 6th July, 1957.

Forms of application may be obtained from the House Governor and should be returned immediately.

N. R. WINWOOD, House Governor.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. Senior HOUSE OFFICER (pædiatrics). Recognised for D.C.H. Post vacant 20th April, 1957.

Applications, stating qualifications, experience and age, with copies of 3 testimonials, to the Medical Superintendent.

BIRMINGHAM. ST. MARGARET'S HOSPITAL, Great BARR PARK, BIRMINGHAM, 22A. (Mental Deficiency—1491 Beds.) RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (Female). Accommodation for single person only.

Applications, stating age, qualifications and experience, together with names and addresses of 3 referees, should be forwarded immediately to the Medical Superintendent.

BROMSGROVE GENERAL HOSPITAL, Worcestershire. (423 Beds.) HOUSE OFFICER in Obstetrics and Gynæcology (pre-registration) required. 38 maternity, 18 gynæcological beds. Post vacant early May, 1957. Recognised for D.Obst. R.C.O.G. and M.R.C.O.G. in Obstetrics.

Applications, with the names of 3 referees, to the Hospital Secretary.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. FAIRFIELD GENERAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry). The appointment is for 1 year in the first instance, subject to renewal annually. This post is recognised for the D.P.M. for 12 months.

Applications, with full details of age, qualifications, and experience, together with names of 2 referees, should be submitted to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. FAIRFIELD GENERAL HOSPITAL, BURY. (496 Beds.) Applications are invited for the pre-registration post of HOUSE OFFICER in Obstetrics and Gynæcology at the above Hospital.

Apply, stating age, qualifications, and experience, together with names of 2 referees, to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of GROUP REGISTRAR in Obstetrics and Gynæcology for the Hospital Group, which includes 156 obstetrical and gynæcological beds within its 2 major hospitals and their associated minor hospitals. The work is conducted mainly at the 2 major hospitals in the Group—viz., Royal Victoria, Bournemouth, and Poole General, Poole. The successful candidate will be required to reside at the Poole General Hospital. The post becomes vacant on 24th June, 1957.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

BOURNEMOUTH AND EAST DORSET GROUP OF HOSPITALS. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Anæsthetics for the above Group with duties including the Christchurch Hospital. This is a new post which is consequent upon the opening of 56 surgical beds at Christchurch Hospital. The post is tenable for 1 year in the first instance and applicants should have had considerable experience in anæsthesia. It will be an advantage if the successful candidate is willing to be resident at 1 of the hospitals.

Forms of application are obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, and should be returned to him within 14 days of the appearance of this advertisement.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of GENERAL HOUSE SURGEON. The appointment, which becomes vacant on 14th May, 1957, is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Thoracic Surgery for duties at the Thoracic Surgical Unit at the above Hospital. The post becomes vacant on 1st July, 1957. The Unit provides full facilities for the surgical treatment of tuberculous and non-tuberculous cases. In addition, the holder of this post normally takes a share in certain general surgical work at the Hospital which takes cases from Bournemouth and parts of Hampshire and Dorset.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (anæsthetics). The post, which becomes vacant on 17th May, 1957, is recognised for the D.A. and F.F.A.R.C.S., and is normally tenable for 12 months. Experience with Thoracic Unit available.

Applications to the Hospital Secretary.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HANTS. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIANS (pre-registration interns) required for posts becoming vacant on 9th May and 1st June respectively at the above Hospital which is now being upgraded by the opening of an Operating Theatre and 56 surgical beds. The total bed complement of 334 also includes 79 acute medical, 34 pædiatric, 6 chest diagnostic, and a geriatric ward. Duties also include attendance at outpatient clinics at the Royal Victoria Hospital, Boscombe.

Applications, with copies of testimonials, to the Hospital Secretary at the Hospital.

BLACKBURN. ROYAL INFIRMARY. (262 general beds.) BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required for 1st May, 1957. Post recognised for F.R.C.S. and approved for pre-registration purposes.

Applications to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

BLACKPOOL VICTORIA HOSPITAL. (353 Beds.) ASSISTANT RESIDENT SURGICAL OFFICER (Senior House Officer grade), vacant 1st June. Recognised for the F.R.C.S. The post offers excellent experience in emergency and general surgery. The evening duties alternate with those of the Resident Surgical Officer.

Applications, with the names and addresses of 2 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

BLACKPOOL VICTORIA HOSPITAL. (Acute General Hospital—353 Beds.) CASUALTY OFFICER (Junior Hospital Medical Officer status). Post vacant at end of May. Salary £775–£50–£1075 p.a. Residence optional. Tenure of post 4 years. Recognised for F.R.C.S.

Applications, stating age, qualifications, experience and giving the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.) 1 HOUSE SURGEON required mid-April. Recognised for pre-registration and F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.) RESIDENT ANÆSTHETIST (Senior House Officer grade) required for 1 year, with interchange of duties by agreement, at the Brighton General Hospital and other specialised units within the Brighton and Lewes Group. Post recognised for F.F.A.R.C.S. and D.A. Applications will be considered for permanent post or as locum.

Applications, stating age, nationality and experience, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital.

CAMBRIDGE. UNITED CAMBRIDGE HOSPITALS. PÆDIATRIC REGISTRAR from end of May, 1957, for 1 year in the first instance, renewable for second year. The successful applicant will work at Addenbrooke's Hospital and at the Cambridge Maternity Hospital.

Apply, with full particulars and names of 3 referees, to Secretary, Addenbrooke's Hospital, by 13th April.

CARDIFF. ST. DAVID'S HOSPITAL.

(*a*) RESIDENT SENIOR HOUSE OFFICER required in Geriatric Unit (200 Beds).

(*b*) RESIDENT OBSTETRICAL HOUSE OFFICER (recognised for M.R.C.O.G.) in Maternity Department.

Both commencing 1st May, 1957.

Form of application, stating post, from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER to the Casualty/Orthopædic and Fracture Departments at the Cardiff Royal Infirmary. The successful applicant will spend 8 months in the Casualty Department and 4 months in the Orthopædic and Fracture Departments. Non-resident post, commencing 1st May.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

CARDIFF (near). CAERPHILLY AND DISTRICT HOS-PITAL. (226 acute general beds.) SENIOR HOUSE OFFICER (general surgery). HOUSE SURGEONS (2 vacancies). Preference given to pre-registration candidates. The posts are recognised by Royal College of Surgeons. 6 miles from the teaching hospital at Cardiff.

Apply to Group Secretary at Hospital.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. HOUSE SURGEON required on Surgical Unit of 78 Beds. Post recognised for F.R.C.S. examination and approved for pre-registration experience.

Applications, stating age, qualifications and experience, with copies of recent testimonials and the names of 2 referees, should be sent to the Secretary at above address not later than 13th April.

CHEADLE ROYAL. Registered Mental Hospital. Applications are invited for the appointment of a SENIOR HOUSE OFFICER. Facilities are offered for Junior Staff to become versed in all branches of psychiatry, and opportunities will be afforded for attendance at courses for the D.P.M. examination at Manchester University. Salary as per National Health Service scale. The Hospital operates outside the National Health Service, but reciprocity has been granted between the National Health Service superannuation scheme so that years of service are transferable in either direction.

Applications, giving full details and enclosing copies of 3 recent testimonials, should be sent to the Medical Superintendent, Cheadle Royal Hospital, Cheadle, Cheshire, within the next 14 days.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. Locum SURGICAL REGISTRAR wanted 2 weeks from 5th May. Salary £17 10s. per week, less £170 p.a for residence.
Apply Group Secretary, 174, Broyle-road, Chichester.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. Locum MEDICAL REGISTRAR required 2 weeks from 16th April. Salary £17 10s. per week, less £170 p.a. for residence.
Apply Group Secretary, 174, Broyle-road, Chichester.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. Also recognised for F.R.C.S. 7 residents including Resident Surgical Officer and 3 House Surgeons. Vacant immediately.
Apply to Senior Administrative Officer.

COLCHESTER. ESSEX COUNTY HOSPITAL. (185 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (anæsthetics). Post tenable for 1 year. Recognised for F.F.A.R.C.S. and D.A. The successful candidate will be called upon to give anæsthetics in other hospitals in the Group.
Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COLWYN BAY AND WEST DENBIGHSHIRE HOSPITAL. (60 Beds—Acute.) Locum JUNIOR HOSPITAL MEDICAL OFFICER required for period 23rd April, 1957–20th May, 1957, inclusive.
Applications, with 2 recent testimonials, to be sent forthwith to Group Secretary, Clwyd and Deeside Hospital Management Committee, "Rhianfa," Russell-road, Rhyl.

COVENTRY AND WARWICKSHIRE HOSPITAL, Coventry. SENIOR ASSISTANT (Junior Hospital Medical Officer grade) for accident and orthopædic wards. Appointment for 1 year in first instance, renewable annually up to 4 years. Recognised F.R.C.S. Previous experience desirable. Resident accommodation available.
Applications to Hospital Secretary.

COVENTRY. WHITLEY HOSPITAL. (153 Beds.) REGISTRAR (infectious diseases) (62 Beds including a Respiratory Paralysis Unit) combining duties in a general medical ward and emergency duties in skin and chest wards. There is also liaison with the Pædiatric Department. Flat available.
Completed application forms to be returned to the Group Secretary, Coventry and Warwickshire Hospital, Coventry, by 8th April, 1957.

CROYDON GENERAL HOSPITAL. (200 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR CASUALTY OFFICER (Registrar status). Post vacant 21st May, 1957. Busy department. Post recognised for Final F.R.C.S. examination. Hospital may be visited on application to Hospital Secretary.
Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, Croydon General Hospital, London-road, Croydon, to be returned within 14 days.

CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Thoracic Medicine tenable for 2 years required at Croydon Chest Clinic. Duties will be mainly at the Croydon Chest Clinic and associated Chest Beds (111 Beds, including beds for non-tuberculous chest conditions), and the successful applicant will work under the direction of the Consultant Chest Physician. Applicants should have wide experience in treatment of tuberculosis and other diseases of the chest. Higher qualification will be an advantage. The clinic may be visited by direct arrangement with the Consultant Chest Physician.
Application forms obtainable from G. A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, to be returned within 14 days.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) SENIOR HOUSE OFFICER (casualty), 1 of 2. Additional appointment available immediately.
Apply, stating full details with copies of 2 recent testimonials, to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (396 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance.
Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 8th April, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DONCASTER HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (Senior House Officer) required between Western Hospital, Doncaster, and Doncaster Royal Infirmary. Resident at Western Hospital.
Applications to the Group Secretary at Doncaster Royal Infirmary.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of HOUSE SURGEON. The post is recognised for pre-registration purposes, and is now vacant. 4 residents on staff. Salary in accordance with National Whitley scale.
Applications, enclosing copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) HOUSE SURGEON (first, second, or third post), required now. Casualty, general surgery, orthopædics, and some gynecology. Approved pre-registration post. Fully qualified practitioners may apply.
Apply Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DURHAM. DRYBURN HOSPITAL. (303 Beds.) House SURGEON. Approved pre-registration post and recognised under the F.R.C.S. regulations. Post vacant now.
Apply, with names and addresses of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. REGISTRAR in Obstetrics and Gynæcology, West Norfolk and King's Lynn General Hospital (146 Beds). Post recognised for D.Obst.R.C.O.G. Single quarters available. Appointment for 1 year, renewable for second year. Candidates invited to visit the Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.
MEDICAL REGISTRAR, Ipswich and East Suffolk Hospital. Single quarters available. Appointment for 1 year, renewable for second year. Candidates invited to visit the Hospital by direct arrangement with Hospital Management Committee Secretary, Ipswich and East Suffolk Hospital, Anglesea Road Wing, Ipswich.
Applications, stating age, experience and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 8th April, 1957.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (702 Beds.) 2 RESIDENT HOUSE PHYSICIANS for above Hospital. Posts vacant 15th and 23rd May, 1957. Recognised for pre-registration purposes.
Applications, stating name, age, address and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 13th April, 1957.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (702 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Pathology, resident, required at above Hospital. Appointment for 1 year in first instance. Previous experience in pathology desirable. Hospital may be visited by direct arrangement with the Medical Director.
Application forms obtainable from, and returnable to, the Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 13th April, 1957.

ENFIELD. MIDDLESEX. CHASE FARM HOSPITAL. Temporary REGISTRAR required in Department of Anæsthesia from 8th April, 1957, for not less than 9 months. Post is recognised for D.A. and F.F.A.R.C.S., and affords a wide experience in practical anæsthesia and tuition under Consultant supervision.
Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL SENIOR HOUSE OFFICER for Casualty duties required 15th May, 1957. Non-resident post, but may very occasionally be required to sleep in, on duty. Recognised by the Royal College of Surgeons for the Final Fellowship examination. 12 months appointment. Hours: 9 A.M.–5.30 P.M., Monday–Friday: 9 A.M.–1 P.M. Saturday.
Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT OBSTETRICAL AND GYNÆCOLOGICAL HOUSE SURGEON (pre-registration post), vacant early April. Unit comprises 44 maternity and 36 gynæcological beds, and is recognised for purposes of D.Obst.R.C.O.G. and M.R.C.O.G. examination, but advertised post is only recognised for D.Obst.R.C.O.G.
Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, immediately.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. Applications are invited for the post of RESIDENT PATHOLOGIST (Senior House Officer grade) for duties in the Area Laboratory and at other hospitals in the Group. The Area Laboratory is recognised for the Diploma of Pathology of the Royal Colleges of Physicians and Surgeons. Further information can be obtained from the Senior Pathologist. Appointment tenable for 1 year. Vacant 26th April, 1957.
Applications, with the names of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, immediately.

EXETER. ROYAL DEVON AND EXETER HOSPITAL Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (surgical)—Resident Surgical Officer. The post is recognised for the F.R.C.S. examination. Vacant 26th April, 1957.
Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 12th April, 1957.

GRAVESEND AND NORTH KENT HOSPITAL, Gravesend, Kent. MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of HOUSE SURGEON, vacant now. The successful applicant will be attached to 2 Consultant Surgeons with opportunities for extensive surgery and special experience in vascular work. Recognised for F.R.C.S. and as a pre-registration post. Salary £425–£525 p.a. according to experience, less £125 for residential emoluments.
Applications, stating age, nationality, qualifications and experience, to Hospital Secretary.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. HOUSE SURGEON (pre-registration) required.
Applications, giving full details and copies of recent testimonials, should be sent to the Hospital Secretary at once.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. Locum Tenens SENIOR HOUSE OFFICER (pædiatrics) required for period 15th–24th April (inclusive).
Applications, together with copies of 2 recent testimonials, should be sent to the Hospital Secretary as soon as possible.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Surgery (urology). Duties in the Urological Department at above Infirmary.

Write, giving 3 names for reference, not later than 6th April, 1957, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

HAREFIELD HOSPITAL, Harefield, Middlesex. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR in Chest Diseases required at above Hospital. Previous experience in general medicine and in the treatment of tuberculosis essential. The Hospital has approximately 450 Beds for the treatment of tuberculosis in all its forms, a non-tuberculosis Thoracic Surgical Unit of 90 Beds, and 100 general medical and surgical beds.

Application forms obtainable from, and returnable to, the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 6th April, 1957.

HERTFORD COUNTY HOSPITAL. (173 Beds. Hospital situated 21 miles from London.) RESIDENT CASUALTY OFFICER (Senior House Officer grade) with attachment to Paediatrician and Ophthalmic Consultant. Salary £745 p.a., less £150 p.a. residential emoluments. Recognised under F.R.C.S. regulations. Appointment to commence immediately.

Apply, with full details and references, to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HALIFAX AREA HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Obstetrics and Gynæcology required for duty at the Halifax General Hospital and Royal Halifax Infirmary. 100 obstetrical and 40 gynæcological beds. Post, which is recognised for M.R.C.O.G., will become vacant on 24th May. Salary £745 p.a., less £150 p.a. for board-residence, &c.

Applications to be forwarded to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX AREA HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER wanted for duties in the wards for chest cases at the Northowram Hospital, Halifax, and the outpatients chest clinic at the Royal Halifax Infirmary. Approximately 20 non-tuberculous chest patients in Hospital and 75 tuberculous. Self-contained flat in good residential accommodation at Hospital.

Applications to be forwarded to the Group Secretary at the Royal Halifax Infirmary, Halifax.

HARROGATE AND DISTRICT GENERAL HOSPITAL. (253 Beds. Recognised for D.Obst.R.C.O.G.) Applications are invited for the resident post of SENIOR HOUSE OFFICER in Obstetrics and Gynæcology, vacant 29th April, 1957.

Applications, naming 2 referees, should reach the Hospital Secretary, Harrogate and District General Hospital, Harrogate, Yorks, as soon as possible.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. CASUALTY OFFICER (resident) required, for duty with Accident Service and as Orthopædic House Surgeon. Recognised as pre-registration post. Vacant mid-April.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 recent testimonials, to Medical Administrator, Lister Hospital.

HORNCHURCH. ST. GEORGE'S HOSPITAL, Ingrebourne CENTRE. Temporary PSYCHIATRIC REGISTRAR required at above Neurosis Unit. Mental Hospital experience essential. Candidate should be specially interested in short-term psychotherapy and social psychiatry. Further information may be obtained from the Hospital which may be visited by arrangement (Tel.: Hornchurch 4181).

Applications, stating names of 2 referees, should be sent to Group Secretary, Oldchurch Hospital, Romford.

HOVE GENERAL HOSPITAL, Sackville-road, Hove, SUSSEX. (75 Beds.) SENIOR HOUSE OFFICER (recognised for F.R.C.S.) vacant 11th May. Duties of Resident Surgical Officer. Appointment for period of 1 year.

Applications, with full particulars of qualifications, experience, &c., with names and addresses of 2 referees, to the Administrative Officer.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HOUSE SURGEON required immediately. Registration or pre-registration post. Recognised for D.C.H.

Applications, together with 2 testimonials, should be sent to the Hospital Secretary.

ILKLEY. MIDDLETON HOSPITAL. (430 Beds.) Resident SENIOR HOUSE OFFICER (surgical) required for Major Thoracic Surgical Unit at the above Hospital.

Applications, stating age, nationality, qualifications, and experience, to Hospital Secretary.

IPSWICH. ST. HELEN'S HOSPITAL. (100 Beds for infectious diseases, pulmonary tuberculosis, and long-stay orthopædics. The area Chest Clinic is in the Hospital.) HOUSE PHYSICIAN required (post-registration appointment). Accommodation available for married man.

Applications to JOHN WILLIAMS, Group Secretary, Ipswich Group Hospital Management Committee, at the Ipswich and East Suffolk Hospital (Anglesea Road Wing), Ipswich.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Locum Tenens CASUALTY OFFICER (Senior House Officer grade), required from 1st May to 26th May, 1957, inclusive.

Applications, with full particulars, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Senior Consultant General Surgeon, vacant on 21st April, 1957. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of SENIOR HOUSE SURGEON to the Fracture and Orthopædic Department, vacant on 9th April, 1957. The post is graded Senior House Officer and is recognised for the F.R.C.S. examinations. The Department has 2 Consultants, about 60 Beds and a large outpatient attendance; it offers wide experience.

Applications, stating age, nationality and experience, together with copies of recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Heath ROAD WING, IPSWICH. (280 Beds.) Applications invited for:—

HOUSE SURGEON (pre-registration) to 2 General Surgeons. Post vacant on 7th May, 1957. Recognised for the R.C.S. examinations.

HOUSE PHYSICIAN (pre-registration). Post vacant on 1st May, 1957.

Applications, with full particulars, and copies of 3 recent testimonials, to the Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. Senior HOUSE OFFICER required for Admissions and Casualty Department. Must have held medical and surgical posts. Recognised for F.R.C.S.

Applications, stating age, nationality, qualifications with copies of up to 3 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 9th April.

KETTERING GENERAL HOSPITAL, Kettering. (130 Beds.) KETTERING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER in Anæsthetics. Post vacant 14th April, 1957. Post recognised for D.A.

Applications, giving details of qualifications and experience, and enclosing copies of 3 recent testimonials, to be sent to the Group Secretary at the above address.

KIDDERMINSTER AND DISTRICT GENERAL HOSPITAL, WORCESTERSHIRE. (112 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON at the above Hospital. Post vacant mid-April.

Applications, with the names of 3 referees, to the Hospital Secretary.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston-UPON-THAMES. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical officers for the post of Locum SENIOR HOUSE OFFICER (orthopædic and casualty) for the period 13th–20th April, 1957.

Applications, stating age, qualifications and experience, with 2 testimonials, should reach the Physician-Superintendent of this Hospital as soon as possible.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (197 Beds.) HOUSE PHYSICIAN. Vacancy suitable for fully qualified or pre-registration applicant. Post vacant 9th May, 1957.

Applications, with copies of 2 recent testimonials, to be sent to Hospital Secretary.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Anæsthetics

Harrogate General Hospital (approximately 150 Beds in surgical specialties). Preferably resident. Recognised for the F.F.A.R.C.S.

General Medicine

St. James's Hospital, Leeds (to be associated with 50 Beds under the clinical care of Physicians from the Teaching Hospital). Resident/non-resident. The successful candidate will be required to "live-in" 1 day in 3 if non-resident.

General Surgery

Hull A Group of hospitals. Duties mainly at Western and Kingston General Hospitals (120 general surgical beds). May include some duties in the Casualty Department. Resident or non-resident. Recognised for F.R.C.S.

Orthopædic Surgery

(i) St. James's Hospital, Leeds (64 orthopædic beds), and the Public Dispensary, Leeds. Non-resident.

(ii) Harrogate General Hospital (38 orthopædic beds). May include some duties in the Casualty Department. Non-resident.

Psychiatry

(i) Storthes Hall Hospital (2750 Beds).

(ii) Menston Hospital, near Leeds (2500 Beds).

If desired, facilities for attendance at Leeds University will be provided if the successful candidates are studying for the D.P.M.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 4th April, 1957.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. HOUSE OFFICER (Senior or Junior) (pre- or post-registration) required for Department of Urology. Post tenable for 6 months from 1st May, 1957. Salary according to grade. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, and 3 names for reference, to be sent to the Secretary to the Board, by not later than 3rd April, 1957.

LEEDS. UNITED LEEDS HOSPITALS/LEEDS REGIONAL HOSPITAL BOARD. REGISTRAR in Thoracic Surgery. First year normally at the Regional Thoracic Centre, Pinderfields General Hospital, Wakefield (56 Beds), which is under the charge of the Consultants to the Teaching Hospital. Second year if possible at the General Infirmary at Leeds. Recognised for F.R.C.S.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names, and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 4th April, 1957.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. RESIDENT ORTHOPÆDIC OFFICER required of Senior House Officer status. The post will initially be for 6 months from 1st May, 1957, and will be renewable for a further period of 6 months thereafter. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, to be sent to the Secretary to the Board by 3rd April, 1957.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. ORTHOPÆDIC REGISTRAR required. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, experience with relevant dates, and giving 3 names for reference, should be forwarded to the Sub-Dean, The Medical School, Leeds, 2, not later than 3rd April, 1957.

LICHFIELD (near). ST. MATTHEW'S HOSPITAL, BURNTWOOD, LICHFIELD, STAFFS. (1350 mental beds.) BURTON-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry) required. Resident accommodation available. Facilities for taking a D.P.M. Course at Birmingham University.

Applications, with 2 references, to the Medical Superintendent.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL EAR, NOSE AND THROAT INFIRMARY. Applications are invited for temporary appointment to a post of REGISTRAR in Otorhinolaryngology to take up duty as soon as possible for the period to 30th September, 1957. The vacancy for the year beginning 1st October, 1957, will be advertised in the summer of 1957 and the person holding the temporary appointment will be free to apply. The tenancy of a furnished flat may be available if required for the successful applicant.

Apply by 12th April, 1957, on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LUTON AND DUNSTABLE HOSPITAL. Senior House OFFICER (resident) in Medicine required. Post vacant 1st April, 1957.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, to Secretary of the Hospital as soon as possible.

LUTON AND HITCHIN GROUP OF HOSPITALS. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time PÆDIATRIC REGISTRAR (resident or non-resident) required for the above Group. Principal duties at Children's Annexe of the Luton and Dunstable Hospital. Hospital may be visited by direct appointment.

Application forms obtainable from Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months appointment. Post vacant now. Salary at the rate of £425–£525 p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MANCHESTER. BOOTH HALL CHILDREN'S HOS-PITAL, BLACKLEY, MANCHESTER, 9. (380 Beds. Recognised for D.C.H.)

JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for Plastic Unit and Regional Burns Unit (45 Beds for severe burns and scalds). Post vacant now. £170 deducted for full emoluments.

RESIDENT SENIOR HOUSE OFFICER (surgical). Duties orthopædic and E.N.T. Post vacant 1st April. £150 deducted for full emoluments.

Applications, giving names and addresses of 2 referees, to be sent to Group Secretary, from whom further particulars may be obtained.

HOUSE OFFICER (surgical), pre- or post-registration. Duties mainly general surgery and neuro-surgery. Post vacant on 1st April.

Applications, with usual particulars and copies of 2 recent testimonials, to Group Secretary.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT SURGICAL OFFICER (Registrar grade) at Wythenshawe Hospital. The post will include responsibility for general surgical and gynæcological beds, and is recognised by the Royal College of Surgeons.

Applications, stating age, qualifications, present post, experience, and names of 2 referees, to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER REGIONAL HOSPITAL BOARD. Bury AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for REGISTRAR in Surgery at Bury General Hospital. This post, which falls vacant in April, is recognised for F.R.C.S.

Applications, together with the names of 2 referees, should be sent to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD invites applications for the post of REGISTRAR in Anæsthetics. The main duties will be with the Stockport and Buxton Hospital Management Committee, with some duties in the Macclesfield and District Hospital Management Committee Group. The post is recognised for the D.A. and F.F.A.R.C.S., and would suit a candidate wishing to study for higher qualification.

Applications, stating age, qualifications, and experience, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in General Surgery to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool (353 Beds). The post, which is vacant in July, is recognised under the F.R.C.S. regulations. The appointment offers an excellent opportunity to suitably qualified candidates for gaining practical experience in general and emergency surgery. A furnished flat is available in the married quarters situated in a detached property in a select residential area adjacent to the Hospital.

Applications, stating age, qualifications, experience, and the names of 3 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Chest Diseases, the main duties to be with the Bury and Rossendale Hospital Management Committee, with duties at Chest Clinics and at Aitken Sanatorium and Peel Hall Pulmonary Hospital, and other hospitals in the area.

Apply, stating names of 2 referees, to—

H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. 2 posts of SENIOR REGISTRAR in Psychiatry as follows :—

(*a*) Salford Group of hospitals (Salford Royal and Hope Hospitals) and Springfield (Mental) Hospital, Manchester.

(*b*) Bury and Rossendale and Rochdale Groups of hospitals.

The person appointed to the latter post may be required to transfer for a period of service to Prestwich Mental Hospital, near Manchester, or to another psychiatric team based on a general hospital centred elsewhere in the region where further experience and training can be obtained.

Application forms, obtainable from the Senior Administrative Medical Officer of the Board, Chestwood-road, Manchester, 8, should be returned by 15th April, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The Board invite applications from registered practitioners for the post of RESIDENT SURGICAL OFFICER (Registrar grade) at the Christie Hospital and Holt Radium Institute. The post provides unique experience in the treatment of tumours and good opportunity for study.

Applications, with full details, including the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD. Sal-FORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for post of REGISTRAR in Anæsthetics (non-resident) in the above Group, main duties at Hope Hospital. The post is recognised for the D.A. and F.F.A.R.C.S.

Applications, together with names and addresses of 2 referees, to be sent to the Group Secretary, Salford Royal Hospital, Salford, 3, immediately.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. 4 SENIOR HOUSE OFFICERS (surgical), 3 to commence on 1st July and 1 on 15th July, 1957. Whole-time, mainly non-resident training posts, tenable for 6 months, renewable for a second 6 months. Duties allotted in Orthopædic, Surgical Outpatients and General Surgical Units in rotation. Resident alternate nights for about 3 months when attached to Orthopædic Unit.

Application form obtainable from the undersigned, to be returned by 20th April, 1957. G. H. TAYLOR, Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) SENIOR HOUSE OFFICER required for Group Laboratory. Post vacant 1st June, 1957, and tenable for 1 year. Duties which alternate with holder of second similar post include routine general pathology and emergency investigations. Laboratory recognised for D.Path. and D.C.P. examinations. Previous experience not essential.

Application forms from Group Secretary.

MITCHAM. WILSON HOSPITAL, Cranmer-road, MITCHAM, SURREY. HOUSE PHYSICIAN (resident), not pre-registration, vacant 18th April.

Applications, stating age, qualifications, &c., with the names and addresses of 2 referees, to the Secretary at above address.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. An ASSISTANT (medical qualification an advantage) is required to participate in a bacteriological investigation of hospital cross-infection, including the problem of antibiotic resistance. The terms and conditions of service are those appertaining to the National Health Service, tenure of the post being limited to 1 year in the first instance. The status and salary of the person appointed will be adjusted according to the qualifications held and previous experience.

Applications, giving full details and the names and addresses of 2 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time non-resident appointment of SENIOR REGISTRAR to the Department of Bacteriology at the Royal Victoria Infirmary. The successful candidate will assist in the general work of the laboratory, including blood-transfusion serology and in the research programme. The appointment will be for 1 year in the first instance and will be subject to terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE REGIONAL HOSPITAL BOARD. Registrar THORACIC SURGEON (whole-time), resident, at Regional Thoracic Centre (150 Beds), Shotley Bridge General Hospital. Work almost entirely non-tuberculosis (cardiovascular, œsophageal and pulmonary) and at associated sanatoria. Applicants must have had good experience in general surgery and a higher qualification or its equivalent. Appointment intended either for trainee in thoracic surgery or for general surgeon seeking special experience. Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, by 8th April, 1957.

NORTHAMPTON GENERAL HOSPITAL. (482 Beds.) Vacancies 1st April, 1957, for the following :—

HOUSE OFFICER (general surgery). Recognised for F.R.C.S. and pre-registration.

HOUSE OFFICER (Dermatological Department) (Harborough Road Hospital). Recognised for medical pre-registration.

Both 6 months appointments in first instance.

Applications, enclosing copies of 3 testimonials, as soon as possible, to S. G. HILL, Superintendent.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. ANÆSTHETIC REGISTRAR required. Duties to be divided equally between the Plastic Centre and the General Hospital, and will include routine and emergency work. Candidates should be working for, or in possession of, the higher qualifications in anæsthesia.

Application forms obtainable from and returnable to, the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 20th April, 1957.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of HOUSE SURGEON (Senior House Officer) to the Casualty Department, vacant 1st May, 1957. Recognised by the Royal College of Surgeons.

Applications, accompanied by 2 testimonials, to be forwarded to the Resident Medical Officer by 23rd April, 1957.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of HOUSE SURGEON, mainly for orthopædic and genito-urinary work. This post is recognised as a pre-registration appointment.

Applications, accompanied by 2 testimonials, to be forwarded to the Resident Medical Officer by 23rd April, 1957.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (pædiatrics), vacant 1st May, 1957. The post is approved for the D.C.H.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER at the Department of Thoracic Surgery. Post vacant immediately. Salary £745 p.a., less £150 for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in General Surgery to the hospitals of Aylesbury and High Wycombe Hospital Management Committees, with duties mainly at Stoke Mandeville and Amersham Hospitals. Resident or non-resident. The appointment will be for 1 year and eligible for extension to a second year.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 6th April.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in E.N.T. Surgery to the hospitals of the Aylesbury/High Wycombe Area. The post is recognised for the D.L.O. and F.R.C.S. The appointment will be for 1 year and eligible for extension to a second year.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, to reach him by 5th April.

OXFORD. UNITED OXFORD HOSPITALS. Locum SENIOR REGISTRAR required in 1 of the General Surgical Firms, for the period 15th April–1st June, 1957. Resident or non-resident.

Applications to the Administrative Assistant, Radcliffe Infirmary, Oxford, as soon as possible.

OXFORD. UNIVERSITY OF OXFORD. UNITED OXFORD HOSPITALS. SENIOR REGISTRAR in General Surgery to the Radcliffe Infirmary. Non-resident. Applicants must hold an F.R.C.S. or M.S. Diploma. A scheme for providing experience in a non-teaching hospital of the Oxford Regional Hospital Board is available if mutually agreed.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 8th April, 1957.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in General Medicine, vacant 12th June, 1957.

SENIOR HOUSE OFFICER in Anæsthetics, vacancies 1st April, 1st May, 1957. Recognised for the D.A. and F.F.A.R.C.S. Appointments will be for a period of 12 months.

Applications, stating age, nationality, qualifications, and experience, together with the names and addresses of 3 referees, to be sent to—

F. HALL, Deputy Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, DEVONPORT. HOUSE SURGEON (pre-registration post), vacant 1st May, 1957. Recognised for the F.R.C.S.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

F. HALL, Deputy Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

ORPINGTON HOSPITAL, Orpington, Kent. Resident SENIOR HOUSE PHYSICIAN (Male or Female) for Geriatric Department. Post vacant 1st June, offers good clinical experience and opportunity for higher studies. Hospital may be visited by appointment.

Applications, with copies of 2 recent testimonials, to Physician-Superintendent.

PORT TALBOT GENERAL HOSPITAL, Hospital-road, PORT TALBOT. (85 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER. Appointment available 21st April, 1957. The successful applicant will work under supervision of Consultants based on Neath General Hospital, Neath.

Applications, naming 2 referees, to be addressed to the Group Secretary, Mid Glamorgan Hospital Management Committee, 8, Wind-street, Neath.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Royal Portsmouth Hospital (70 surgical beds)

SENIOR HOUSE SURGEON, vacant 15th April, 1957.

HOUSE SURGEON (pre-registration post), vacant now.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

St. Mary's Hospital, Milton-road, Portsmouth.

PORTSMOUTH AND ISLE OF WIGHT AREA PATHO-LOGICAL SERVICE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Pathology, vacant 1st June, 1957. The successful candidate will be expected to do a tour of duty in the Departments of Bacteriology, Hæmatology, Histology and Biochemistry at the Central Laboratory, and may also be required to work in any of the laboratories covered by the Service. The Laboratory is recognised for the Diploma of Pathology.

Forms of application may be obtained from the Group Secretary, Portsmouth Group Hospital Management Committee, Saint Mary's Hospital, Milton, Portsmouth, which should be returned to him duly completed on or before 12th April, 1957. Canvassing will disqualify. Candidates may visit the Central Laboratory, Milton-road, Portsmouth, by arrangement with the Senior Pathologist.

READING COMBINED HOSPITALS. Area Department OF OBSTETRICS AND GYNÆCOLOGY. (100 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the resident appointment of GYNÆCOLOGICAL HOUSE SURGEON at the Royal Berkshire Hospital, Reading. Vacant 1st April and tenable for 6 months. Post recognised for M.R.C.O.G.

Write, stating age and qualifications with dates, nationality, and present post, with copy of 1 recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (339 Beds.) READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the appointment of a SENIOR HOUSE OFFICER (anæsthetics), vacant 1st May, 1957, for a period of 1 year. Post recognised for F.F.A.R.C.S. Salary £745 p.a., less £150 for board-residence.

Write, stating age, qualifications with dates, nationality and present post, together with the names of 3 referees, to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

REDHILL COUNTY HOSPITAL, Redhill, Surrey. Locum REGISTRAR (obstetrics and gynæcology) required 8th April–18th May, inclusive. Resident accommodation provided.

Apply Group Secretary, Redhill Hospital Management Committee, Earlswood Mount, Pendleton-road, Redhill (Redhill 3581, Extn. 20).

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. SENIOR HOUSE OFFICER (Male), mainly surgical. Post vacant April.

Apply to the Hospital Secretary.

RHYL. ROYAL ALEXANDRA HOSPITAL. (138 Beds.) Applications are invited from pre-registration or registered medical practitioners for the post of HOUSE PHYSICIAN for the Departments of Medicine and Pædiatrics at the above Hospital.

Applications, with 2 testimonials, to be sent forthwith to Group Secretary, Clwyd and Deeside Hospital Management Committee, "Rhianfa," Russell-road, Rhyl.

RICHMOND, SURREY. CASSEL HOSPITAL FOR FUNCTIONAL NERVOUS DISORDERS (GROUP 51). SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Psychotherapy. Candidates must be Psychiatrists with special interest in psychoanalysis and experience in psychotherapy. Candidates may visit the Hospital by appointment.

Application forms may be obtained from the undersigned and should be returned to the Secretary within 14 days of the appearance of this advertisement.

D. MALLION, Secretary,
Cassel Hospital Management Committee.
Ham Common, Richmond, Surrey.

RICHMOND, SURREY. ROYAL HOSPITAL. (Acute General Hospital—121 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in Surgery. Post vacant on 12th April, 1957.

Applications immediately, with names of 2 referees, to the Administrative Officer.

ROCHDALE INFIRMARY. Senior House Officer (anæsthetics) required.

Applications, with names and addresses of 2 referees and full particulars, to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT PÆDIATRIC HOUSE PHYSICIAN (Male or Female) required from April, 1957. The department includes a Premature Baby Unit of 9 cots and 50 children's medical beds.

Applications should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE SURGEON required from 28th March, 1957, in the General Surgical Unit. Recognised for F.R.C.S. Open to either pre-registration applicants or to fully qualified practitioners. This very active Unit of a total of approximately 180 Beds affords ample opportunities for candidates to obtain first-class tuition and experience. The candidate appointed will be attached to a unit of approximately 60 Beds.

Applications should be forwarded immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER required in the Obstetric and Gynæcological Unit consisting of 88 obstetric and 52 gynæcological beds. Post recognised for the D.Obst.R.C.O.G. and M.R.C.O.G.

Applications should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required immediately. (Not pre-registration appointment.)

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of REGISTRAR to the E.N.T. Department. Post recognised for D.L.O. and F.R.C.S.

Application forms obtainable from, and returnable to, Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury, Wilts.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON (recognised by R.C.O.G.) to run consecutively in this order from 2nd May, 1957, for a period of 6 months in each post. The posts are open to pre-registration candidates.

Apply, giving names and addresses of 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. (262 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 8th April, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

SENIOR REGISTRAR for duties with the Regional Consultant in Plastic Surgery.
SENIOR REGISTRAR in Surgery based at the Western Infirmary, Glasgow.
SENIOR REGISTRAR in Surgery based at the Royal Infirmary, Glasgow.
SENIOR REGISTRAR in Surgery based at Stobhill Hospital, Glasgow.
SENIOR REGISTRAR in Medicine based at the Royal Infirmary, Glasgow.
SENIOR REGISTRAR in Ophthalmology based at the Glasgow Eye Infirmary.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 13th April, 1957.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD invite applications for the post of Whole-time NON-RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER at Inverness. The post provides experience in general practice as locum tenens as well as hospital work in selected departments. Tenure of appointment is 1 year.

A note of further particulars and an application form are obtainable from the undersigned, with whom applications should be lodged by 27th April, 1957.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR at the County Hospital, Stornoway (tuberculosis and infectious diseases). A house is available for a married officer.

Further particulars and forms of application are available from the undersigned, with whom applications should be lodged by 27th April, 1957. A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Radiodiagnosis based at the Royal Infirmary of Edinburgh with duties at other hospitals in the region.

Apply, giving particulars of age, qualifications and previous experience, and the names of 3 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 20th April.

SHEFFIELD, S. CITY GENERAL HOSPITAL. Applications are invited for the resident (pre-registration) post of HOUSE SURGEON (orthopædics), vacant on 6th April, 1957.

Apply, giving full details of age, nationality, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, to the Group Secretary, Nether Edge Hospital, Sheffield, 11.

SHEFFIELD. CITY GENERAL HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (anæsthetics) required at the above Hospital. Recognised for the F.F.A. R.C.S. examination. Post vacant 22nd April. Successful candidate to reside in Hospital when "on call." This is a large general hospital (652 Beds) with a Department of Thoracic Surgery, a Regional Cardiological Centre and a Professorial Gynæcological Unit. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 8th April, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL INFIRMARY/ROYAL HOSPITAL. Applications invited for the non-resident post of REGISTRAR to the Department of Radiology at the above Hospitals.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 6th April, 1957, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHREWSBURY. ROYAL SALOP INFIRMARY. Ortho-PÆDIC/ACCIDENT HOUSE SURGEON (Senior House Officer). Successful applicant will be allowed to attend for 2 days a month at the Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, for postgraduate study, with the Consultant. Post recognised under revised Fellowship regulations in respect of 6 months training required for the Final Fellowship examination. Vacant immediately.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) RESIDENT ÆNÆSTHETIST (Senior House Officer). Post recognised for F.F.A.R.C.S. Registrar also employed. Vacant immediately.

Applications and copy testimonials to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE SURGEON, vacant immediately. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post recognised for Pre-registration Service and tenable for 6 months. The Hospital is the centre to which all trauma from a large industrial town and port is directed thus providing excellent experience in the treatment of traumatic conditions ; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds. Recognised for F.R.C.S.) CASUALTY OFFICER (Senior House Officer grading), required beginning April.

Applications, with copies of testimonials, to be submitted as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) 2 RESIDENT HOUSE SURGEONS required. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Locum MEDICAL REGISTRAR required for period 29th April–12th May, both dates inclusive.

Applications, stating age, qualifications and experience, to be sent to the Secretary at the Hospital as soon as possible.

J. C. FIELD, Secretary.

SOUTHPORT GENERAL INFIRMARY. Junior Hospital MEDICAL OFFICER (resident), whole-time casualty post, vacant end of April.

Apply, stating age, qualifications, experience, nationality, enclosing copies of 2 recent testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

ST. ASAPH HOSPITAL, St. Asaph. (54 obstetric beds: 23 gynæcological beds.) Applications are invited from pre-registration or registered medical practitioners for the post of JUNIOR HOUSE OFFICER. Post tenable for 6 months from 1st May, 1957. Recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Applications, with 2 testimonials, to be sent forthwith to Group Secretary, Clwyd and Deeside Hospital Management Committee, "Rhianfa," Russell-road, Rhyl.

STIRLING AND CLACKMANNAN HOSPITALS BOARD OF MANAGEMENT. A vacancy has occurred for a RESIDENT HOUSE SURGEON (pre-registration) at Clackmannan County Hospital.

Applications should be sent to the Group Medical Superintendent, Royal Infirmary, Stirling.

ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. WHISTON HOSPITAL, PRESCOT. (892 Beds.) Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER for the Orthopædic Department at the above Hospital. The department contains over 60 Beds and there is a large Outpatient Department and fracture clinic.

Applications, stating age, qualifications and experience, and giving 2 names for reference, should be forwarded to—

N. RICHARDS, Group Secretary.

Whiston Hospital, Prescot, Lancs.

STOCKPORT INFIRMARY. Stockport and Buxton HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics). The post may be resident or non-resident (preferably resident) and is recognised for the D.A. and F.F.A.R.C.S. There are facilities for study.

Applications, stating age, experience, and qualifications, together with copies of 2 testimonials, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, immediately.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (845 Beds.) HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. Applications invited for HOUSE OFFICER (medical), vacant early April. Recognised pre-registration post.

Detailed applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (orthopædics) required. Recognised pre-registration post. Hospital recognised for F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

SULLY HOSPITAL, Sully, Glamorganshire. Regional THORACIC CENTRE. (324 Beds.) SENIOR HOUSE OFFICER (surgical) required to commence 1st May, 1957. Experience will be gained in investigation and treatment of chest and heart conditions.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

SWANSEA HOSPITAL, Swansea. Glantawe Hospital MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in the Surgical Unit of the above Hospital. Immediate vacancy. The post is recognised under the F.R.C.S. (Eng.) regulations.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary. T. E. JONES, Group Secretary.

SWANSEA HOSPITAL, Swansea. (403 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the Gynæcological Department at the above Hospital.

Applications, with full particulars, should be addressed to the Hospital Secretary. T. E. JONES, Group Secretary.

TORQUAY. TORBAY HOSPITAL. (166 Beds.) Senior RESIDENT HOUSE OFFICER (anæsthetics) required 21st April, 1957. There is a complement of 6 Resident House Officers, and the Hospital is recognised for the D.A. and the F.F.A.R.C.S.

Applications, stating qualifications, age, nationality, with copy testimonials, to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TUNBRIDGE WELLS. KENT AND SUSSEX HOSPITAL. (303 staffed available beds.) Locum RESIDENT SURGICAL OFFICER required 14th April, 1957, pending permanent appointment. Salary £17 10s. per week, less deduction at rate of £170 p.a. for residence.

Applications, stating age, nationality, qualifications, previous appointments with copies of 2 recent testimonials, to Group Secretary, Sherwood Park, Pembury-road, Tunbridge Wells, as soon as possible.

WARRINGTON GENERAL HOSPITAL. (344 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (pædiatrics), Male or Female. Post recognised for D.C.H. Scale of salary £745 p.a., less £150 for residential emoluments.

Applications to be forwarded to—

HENRY L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee,
c/o The General Hospital, Warrington, Lancs.

WATFORD CHEST CLINIC, PEACE MEMORIAL HOSPITAL, WATFORD. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications invited for the post of REGISTRAR at the above Chest Clinic and associated beds (tuberculosis 47, chest medicine 16) at Shrodells and Holywell Hospitals. This is a new Chest Clinic. A car is necessary—usual allowances paid. Experience in general medicine and tuberculosis work, including refill techniques is essential. This Chest Unit is closely associated with Harefield Hospital, the Physician-in-charge being on the Consultant staff of this Hospital. Applicants invited to visit the Clinic and should contact the Physician-in-charge.

Application form obtainable from, and returnable to, the Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 10 days after the appearance of this advertisement.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. HOUSE PHYSICIAN (pre-registration or Senior House Officer according to experience) required for the Neurological Department which is closely associated with the Teaching Hospital at Leeds.

Written applications, giving full personal particulars, details of experience, and 2 names and addresses for reference, to be addressed to W. BOWRING, Group Secretary.

Victoria Chambers, Wood-street, Wakefield.

WELSH REGIONAL HOSPITAL BOARD. Registrar in General Medicine to serve West Wales Hospital Management Committee. Based Pembroke County War Memorial Hospital, Haverfordwest (163 Beds). Might be expected to serve other hospitals in group. Resident/non-resident. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WEST BROMWICH AND DISTRICT GENERAL HOSPITAL. HOUSE SURGEON, vacant 1st April, 1957. Pre-registration.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WEST HARTLEPOOL GENERAL HOSPITAL. (471 Beds.) HARTLEPOOLS HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE PHYSICIAN at the above Hospital, vacant now.

Applications, stating age, nationality and qualifications with dates, and accompanied by copies of 2 testimonials, should be sent to the Group Secretary at the General Hospital, West Hartlepool, as soon as possible.

WEYMOUTH AND DISTRICT HOSPITAL. (124 Beds.) CASUALTY OFFICER (Senior House Officer grade) required for 4 months—June–September, 1957.

Applications, stating age, qualifications, nationality and experience, together with 2 copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset, immediately.

WICKFORD (near), ESSEX. RUNWELL HOSPITAL. (1032 Beds.) SENIOR HOUSE OFFICER (Male or Female) required for 1 of the Consultant's Divisions and to assist in outpatient work. Excellent postgraduate facilities for D.P.M. Salary £745, residential charge £150.

Applications, with copies of testimonials, to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (315 Beds.) HOUSE PHYSICIAN (obstetrics) (recognised D.Obst.R.C.O.G.), required. Vacant 30th May.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (315 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant 1st June.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (315 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience available under Area Orthopædic team. Appointment for 6 months in first instance. Vacant early April.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Obstetric AND GYNÆCOLOGICAL HOUSE SURGEON required, Male or Female, for post vacant 20th May. Post recognised for both M.R.C.O.G. and D.Obst.R.C.O.G. Not a pre-registration post. Successful candidate will be resident at the Old Windsor Unit of the Hospital.

Applications, stating age, nationality, qualifications with dates, with copies of recent testimonials or names of 3 referees, to Secretary by 10th April.

WOLVERHAMPTON. NEW CROSS HOSPITAL. (627 Beds.) Pre-registration HOUSE OFFICER in Surgery, vacant 16th April, 1957.

Applications to the Secretary.

CANADA. NORTHWESTERN GENERAL HOSPITAL, TORONTO, 9, ONTARIO. Accredited Hospital, 110 Beds, requires INTERNES. Applications are being considered for Rotating Internship. Pay $150 per month, plus room and board. Ideal preparation for general practice in Toronto area.

British University qualifications accepted in Canada.

CANADA. ST. PAUL'S HOSPITAL, Vancouver, British COLUMBIA, CANADA. Applications are invited for 1-year JUNIOR ROTATING INTERNESHIPS at approved large general hospital. Remuneration $150 per month. Assistance with fare will be considered, details on request.

Apply—Sister Superior, St. Paul's Hospital, 1081 Burrard-street, Vancouver, British Columbia, Canada. Canadian, American or British graduates only are acceptable.

U.S.A. BINGHAMTON CITY HOSPITAL, Binghamton, NEW YORK. 1-year ROTATING INTERNSHIP available, 500-Bed Hospital, teaching programme, full maintenance and $125 monthly. Excellent library, Pathologic and Radiologic Departments. Opportunity to become Resident in Medicine or Surgery.

Apply to Medical Director.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. For JUNIOR HOSPITAL MEDICAL OFFICERS or SENIOR HOUSE OFFICERS vacancies, see Page 37, under Senior Appointments.

Public Appointments

BRADFORD, CITY OF BRADFORD. Health Department. DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER. Applications are invited from registered medical practitioners who hold a Diploma in Public Health for the above appointment. Candidates should have had experience in all branches of the Public Health and School Health Services. Salary £1700–£105 (2)–£55 (1)–£1965 p.a. The post is superannuable, is subject to 3 months notice on either side, and a medical examination will be necessary.

Forms of application and particulars of duties may be obtained from the Medical Officer of Health, Town Hall, Bradford, 1, and should be returned to the undersigned within 14 days of the appearance of this advertisement

Town Hall, Bradford. W. H. LEATHEM, Town Clerk.

CHESTER, CITY OF CHESTER. Assistant Medical OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. Salary scale £1050–£50–£1200–£55–£1475 p.a. Car allowance. Housing accommodation can be provided in suitable circumstances. Duties approximately half school work and half Local Health Authority work. Possession of D.P.H. or D.C.H. advantageous.

Application forms from Medical Officer of Health, St. Martin's House, Chester, to whom they should be returned by 13th April, 1957.

DERBYSHIRE COUNTY COUNCIL. County Health DEPARTMENT. ASSISTANT MATERNITY AND CHILD WELFARE MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER. Applications are invited from registered medical practitioners for a whole-time superannuable post in the South-East of Derbyshire. Salary £1050–£50–£1200–£55–£1475 p.a. Car allowance.

Particulars and forms of application are obtainable from Dr. J. B. S. MORGAN, County Medical Officer, St. Mary's-gate, Derby, to whom they should be returned by 15th April, 1957.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
ACCRINGTON ..	LANCASTER ..	13TH APRIL, 1957

GOVERNMENT OF ADEN PROTECTORATE. Ophthal-MOLOGIST required by Aden Protectorate Health Service based on Makhzan, Western Aden Protectorate, where there is a developing base hospital and a health services training centre, but about half time to be spent on tour in both Protectorates, working in hospitals, health units, in the field, and training sub-professional staff in simple eye work. Private practice allowed, but very limited. Candidates must possess qualifications registrable in United Kingdom, D.O.M.S. or equivalent and practical experience. Knowledge of Arabic an advantage. Appointment on contract for 4 years with gratuity (taxable) of £37 10s. for each completed 3 months of service, payable on satisfactory completion of contract. Salary scale from £1212 to £1992 a year, starting point depending upon age and experience. Following allowances also payable :—

(*a*) Outfit allowance £60.

(*b*) Education allowance in lieu of passage entitlement for children between 8–18 undergoing full-time education in the United Kingdom.

(*c*) Protectorate allowance from £132 to £180 a year.

Furnished quarters at low rental. Income-tax at local rates. Free passages for Officer, wife, and up to 4 children under age 18. Tour of service 18–24 months. Generous home leave after each tour.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD. 117/2/010).

NOTTINGHAM, CITY OF NOTTINGHAM. Health SERVICES. SENIOR ASSISTANT MEDICAL OFFICER. Applications are invited for this appointment from Male registered medical practitioners holding the Diploma of Public Health. Salary will be within the scale £1150–£1575 p.a. ; commencing salary will be fixed in accordance with experience. The successful candidate will be given opportunities for administrative and practical experience in all services of the Health Department. The appointment is superannuable and subject to the usual conditions.

Forms of application may be obtained from the Medical Officer of Health, Huntingdon-street, Nottingham, to whom they must be returned, together with the names of 2 referees, by not later than 19th April, 1957. T. J. OWEN, Town Clerk.

Guildhall, Nottingham, March, 1957.

STAFFORDSHIRE COUNTY COUNCIL. Appointment of ASSISTANT COUNTY MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER. Applications are invited from fully qualified medical practitioners and those holding the Diploma of Public Health will be given preference. The candidate appointed will undertake clinical work in the School Health and Child Welfare Services under the direction of the County Medical Officer of Health, and will be required to perform such other duties as may from time to time be prescribed. The salary scale is £1050–£50–£1200–£55–£1475, and increments may be given for previous similar service. The appointment will be terminable by 3 months notice in writing on either side and subject to the provisions of the appropriate superannuation acts and regulations, in which connection the selected candidate must pass a medical examination and submit his or her birth certificate.

Forms of application may be obtained from the County Medical Officer, County Buildings, Stafford, to whom they should be returned when completed not later than 13th April, 1957. T. H. EVANS, Clerk of the County Council.

County Buildings, Stafford, 12th March, 1957.

U.S.A.

MENTAL HOSPITAL PHYSICIANS.—These positions involve the performance and supervision of medical care and administrative services for patients in a 2800-Bed mental hospital in the Shenandoah Valley of Virginia. Merit increases, vacation, and sick leave with pay, retirement benefits.

STAFF PHYSICIAN,—2 years of psychiatric experience, at least 1 of which must have been in a mental hospital ; licence to practise medicine in State or eligibility therefor ; starting salary $8784 per year.

JUNIOR PHYSICIAN.—Graduate from a recognised medical college supplemented by 1 year of rotating internship in an approved hospital ; licence to practise medicine in State or eligibility therefor ; starting salary $8400 per year.

Apply for the above positions to Superintendent, Western State Hospital, Staunton, Virginia, U.S.A.

WORCESTERSHIRE COUNTY COUNCIL. Assistant COUNTY MEDICAL OFFICER OF HEALTH (Worcestershire 5/11ths) MEDICAL OFFICER OF HEALTH (Bromsgrove Urban and Rural Districts 3/11ths each). Applications are invited from registered medical practitioners possessing D.P.H. and recognised by Ministry of Education for ascertainment of handicapped pupils. Duties include maternity and child welfare (with attendance at centres), School Health Services and full range of public health duties. Salary not less than £1600, rising to a maximum of £1961. Car allowance.

Applications forms, with details, from County Medical Officer, County Buildings, Worcester. (S.174.)

WORCESTERSHIRE COUNTY COUNCIL. Assistant COUNTY MEDICAL OFFICER OF HEALTH (Worcestershire 6/11ths) MEDICAL OFFICER OF HEALTH (Redditch Urban District 5/11ths). Applications are invited from registered medical practitioners possessing D.P.H. and recognised by Ministry of Education for ascertainment of handicapped pupils. Duties include maternity and child welfare (with attendance at centres), School Health Service and full range of public health duties. Salary not less than £1528, rising to a maximum of £1908. Car allowance.

Application forms, with details, from County Medical Officer, County Buildings, Worcester. (S.175.)

General Practice

Required. Trainee Assistant, Group Practice, 4 Principals, entrée to large general hospital, Epping Rural Area, statutory salary and car allowance.—Drs. EVANS, SHARP, KORTE & GRYLLS, Station-road, Epping, Essex (Tel. : Epping 2727).

Miscellaneous

THE UNIVERSITY OF MANCHESTER. Applications are invited for the post of MEDICAL ARTIST who will be responsible for the preparation of paintings, drawings, diagrams and similar works for members of the staff of the Medical School, both in the University and in the United Manchester Hospitals. Salary not less than £600 p.a. Duties to begin in October, 1957, or as early as possible thereafter.

Applications should be addressed to the Registrar, the University, Manchester, 13, and should reach him not later than 15th April, 1957. Applicants, should give the names of not more than 3 persons to whom reference may be made and may also submit copies of not more than 3 testimonials which will not be returned.

Surgeon (F.R.C.S.) required immediately for relieving duties for a period of 4–6 months with a British Oil Company in South America. Work would be mainly surgical in the Company's Hospital but would include some general medical duties. Salary from £150 per month according to experience, with free board and lodging and passage both ways.—Reply, giving details of experience, to Address, No. 289, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Medical Copywriter required by medical department of firm of Manufacturing Chemists in Switzerland. Must have excellent command of English language with great facility of expression in writing. Knowledge of German and/or French an advantage. Important that applicant should have had some medical, biological, physiological or related education and experience. Must be familiar with medical terms. Age 25–35. —Full particulars of education and experience to be sent to : Address, No. 286, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Dental Surgeon (Specialist) wishes to obtain accommoda-tion in Doctor's practice Wimbledon, Kingston, Twickenham or Richmond.—Address, No. 290, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

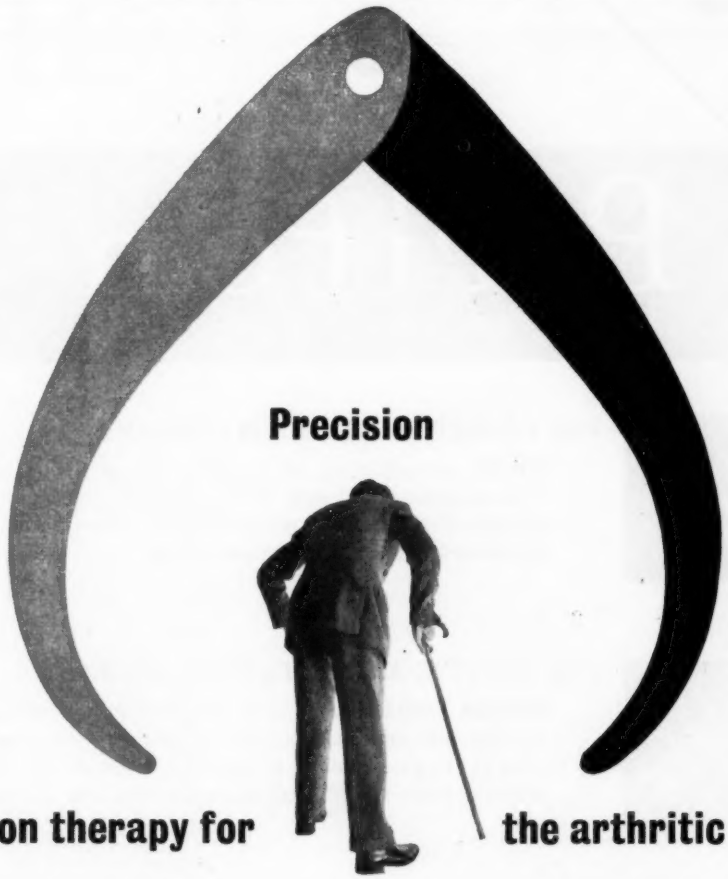
"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hematology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moder-ate prices by experienced medical typists. Electric machines. —SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

Indian Medical Association Annual Dinner and Dance will be held on 4th April, 1957, at the Cumberland Hotel, Marble Arch, W.1. Guest of Honour Sir FRANCIS WALSHE, M.D., F.R.C.P.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, March 30, 1957.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.



Precision

iron therapy for the arthritic

"The common association of an anaemia with rheumatoid disease has been recognised for many years . . ."

Iron?—"Blood transfusions have been given with good results but improvement has been transient".

Oral iron?—"The prolonged administration of iron by mouth has not proved very effective".

Intravenous iron?—"... the difficulty of giving such injections to patients with joint deformity is a drawback as well as the inability to cause unpleasant side reactions".

Intramuscular iron?—"Clearly, an iron preparation for intramuscular injection free from side effects and fairly rapidly absorbed would be a great advantage . . . It is concluded that . . . in the treatment of th anaemia of rheumatoid arthritis . . . intramuscula iron is as beneficial as intravenous iron and easier t administer." Ann. Rheum. Dis., 1956, **15,** 51.

Conclusion:

A fall in haemoglobin is a common feature in arthrit and its restoration to normal is an essential part of th treatment. Restoration of a normal haemoglobin lev can be quickly and surely achieved with Imferon.

Imferon IRON-DEXTRAN COMPLEX

TRADE MARK

BENGER PIONEERS IN PARENTERAL IRON THERAPY · BENGER LABORATORIES LTD., HOLMES CHAPEL, CHESHIR

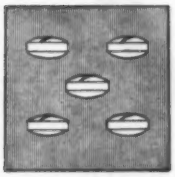
A H

Piriton

the safe, low dosage antihistamine

FOR EXPECTORANT COUGH THERAPY

PIRIEX, a combination of an antihistamine of low toxicity with accepted expectorant drugs, effectively liquefies tenacious sputum and aids its prompt removal. Piriex is suitable for administration to children and adults.



FOR ROUTINE ANTIHISTAMINIC THERAPY

PIRITON TABLETS containing 4 mg. of Piriton maleate, an improved antihistamine, provide distinct symptomatic relief of allergic symptoms in hay fever, vasomotor rhinitis, urticaria, angio-neurotic œdema, insect bites, etc.

FOR PARENTERAL ANTIHISTAMINIC THERAPY

PIRITON INJECTION, containing 10 mg. of Piriton maleate per c.c is indicated for the prevention and treatment of reactions due to penicillin, other parenteral medications and blood transfusions.

FOR PÆDIATRIC ANTIHISTAMINIC THERAPY

PIRITON SYRUP is the ideal form of administration for antihistaminic therapy to children of all ages. It is compatible with many drugs and its use as a base is often advisable when it is desired to administer medications to which the patient is known to be allergic.

C56/626/H

ALLEN & HANBURYS LTD LONDON E 2

TELEPHONE: BISHOPSGATE 3201 (20 LINES). TELEGRAMS: "GREENBURYS, BETH, LONDON"